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FM 23-5

DEPARTMENT OF THE ARMY FIELD MANUAL

*Supersedes FM 23-5
May 65*

U. S. RIFLE

CALIBER

.30, M1

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HEADQUARTERS, DEPARTMENT OF THE ARMY
SEPTEMBER 1958

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FM 23-5

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FIELD MANUAL

U. S. RIFLE, CALIBER .30, M1

FM 23-5

CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 22 June 1960

FM 23-5, 26 September 1958, is changed as follows:

All range and target dimensions and distances that appear in the narrative, firing tables, and illustrations in this field manual will be changed to the metric system, using the conversion tables in appendix VIII, which is added by these changes.

There are two exceptions to the above directive:

(1) It will not be practicable to change the procedure for zeroing as described in paragraphs 69-73 until target dimensions as well as ranges have been converted to *even* units of the metric system; (2) the tables in appendix VIII have not been used to convert the 100-yard mental unit of measure used in range determination. For practicality in teaching, the number of yards have been changed to the same number of meters; that is, 100 yards to 100 meters, 500 yards to 500 meters, etc.

Conversion to the metric system is required by AR 700-75, 14 May 1957.

81. Courses

* * * * *

b. *Combat Qualification Course*. This course is * * * night firing (ch. 6). This course is fired annually for qualification, regardless of prior qualification. It is the only known distance course for which a qualification classification may be awarded to active duty personnel.

c. (Superseded) *Alternate Qualification Course*. This course is intended for the use of reserve component units not in active military service. These units do not have the time or facilities to fire the combat qualification course.

* * * * *

107. Introduction

* * * * *

c. (Superseded) Training in individual night firing is presented in four phases—

- (1) Orientation night firing.
- (2) Night vision.
- (3) Daytime instruction firing.
- (4) Application night firing and night record firing, table VI.

108. Ranges

* * * * *

b. (Superseded) A range for daytime instruction firing may be set up on any terrain where M targets can be erected 50 meters from the firing line.

Section II. ORIENTATION NIGHT FIRING

109. General

(Superseded)

a. In this phase of instruction, the rifleman experiences the difficulties encountered by any untrained soldier when he attempts to deliver effective rifle fire at night. He experiences these difficulties by using his own method of engaging the target (table VI, app. II). He receives no instruction before firing that will help him to overcome the difficulties.

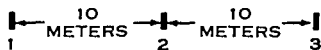
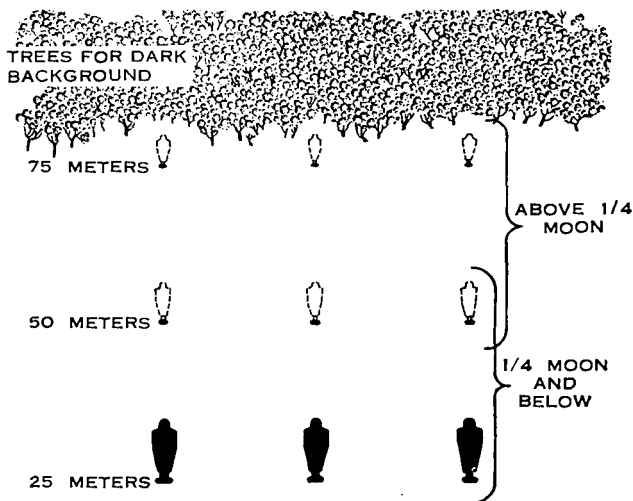


Figure 107. (Superseded) Individual night firing range.

b. Each firing order is critiqued after firing. During the critique, the rifleman is questioned in a manner which will bring out the difficulties he encountered. These difficulties fall into two major categories, target detection and weapon alinement.

(1) *Target detection.* The average rifleman sees the target vaguely at first, but as he stares at it, it fades or disappears. He finds that when he looks directly at his target, he can see the targets to the left and right more clearly than his own. The mass of the weapon itself obstructs the firer's field of vision or obscures his target. Muzzle flash temporarily blinds the firer, slowing down his rate of fire.

(2) *Weapon alinement.* Under most conditions of illumination at night, the sights on the rifle cannot be used. Therefore, the soldier has no means of aiming the weapon at night. Most soldiers discover that, even when their rounds hit the target, most of the hits are high and to the left.

c. Upon completion of orientation night firing, the rifleman is prepared to receive the following phases of instruction in which he is taught to overcome the difficulties involved in target detection and weapon alinement.

110. Organization and Conduct of Firing

* * * * *

b. (Superseded) *Control Personnel.*

(1) Officer in charge of firing.

(2) One safety officer per 20 firing points.

(3) One assistant per 5 firing points.

c. (Superseded) *Conduct of Firing*. The range, under control of the officer in charge of firing, is divided into several sections, Alfa, Bravo, etc., each under the direct control of a safety officer. The assistants on the firing line are designated Alfa 1, Alfa 2, etc.

(1) When all riflemen are assembled behind their assigned points, each assistant reports verbally to the safety officer for his section, "Alfa 1 is UP, Sir."; "Alfa 2 is UP, Sir," etc. The safety officer reports verbally to the officer in charge of firing when his section is UP.

(2) When the entire firing line is UP, the officer in charge of firing asks twice, "Is there anyone downrange?". Anyone who is downrange when this question is asked sounds off immediately. When the range is clear, the officer in charge of firing commands the first order to move up to the firing line and assume the prone firing position. He directs the assistants to issue 1 clip of ammunition to each firer.

(3) The officer in charge of firing gives the commands to load and to fire.

(4) As each man completes firing at the near range, he locks his weapon and the assistant clears it. The rifleman returns to the rear of his firing point. CLEAR

signals are given verbally by the assistants as "Alfa 1 is CLEAR, Sir.," etc.

- (5) When all safety officers have reported their sections CLEAR, the officer in charge of firing declares the firing line CLEAR and commands the firers of the first firing order to move downrange and to stand by their targets for scoring.
- (6) The assistants mark and score the targets in the presence of the firers. The firers then move their targets to the far range and return to the rear of their firing points.
- (7) The firers of the first order next fire on the targets at the far range, watch as targets are marked, then move the targets back to the near range.
- (8) Upon completion of firing at both ranges, each order is instructed to proceed to the critique area.
- (9) The procedure described above is followed for each firing exercise and each firing order.

Section III. NIGHT VISION

(Superseded)

111. General

(Superseded)

In the second phase of instruction, the soldier is taught to overcome, in large part, the difficulties involved in target detection through training in night vision. He is taught to use his eyes more effectively at night.

112. Sequence of Instruction

(Superseded)

a. Explain the basic functioning of the human eye (FM 21-75). The eye is equipped to function under both high and low conditions of illumination. An understanding of this aids the soldier in all his night vision training.

b. Explain the four principles of night vision (FM 21-75). These principles must be applied in order to locate the target at night and keep it under observation.

c. A practical exercise in applying the principles of night vision greatly increases the soldier's ability to use his eyes effectively at night. This exercise may be conducted out of doors at night or in a specially prepared building (FM 21-75).

Section IV. DAYTIME INSTRUCTION FIRING

113. General

(Superseded)

a. In the third phase of instruction, the rifleman learns and practices the technique of night firing. This phase is conducted in daylight so the instructor can see to supervise it.

b. This phase of training combines the methods for overcoming the difficulties of target detection and weapon alinement.

113.1. Sequence of Instruction

(Added)

The instruction is presented by conference,

demonstration, and practical exercise, in the following sequence:

a. *Principles of Night Vision.* The four principles of night vision must be used in locating the target and keeping it in view (FM 21-75).

b. *High Head Position.* The head is held high to keep the mass of the weapon from obscuring the view to the target. Also, the field of vision increases and the sharpness of detail improves as the eyes are raised above ground level.

c. *Use of Both Eyes.* The firer greatly increases his ability to see at night and has a wider area of vision when he uses both eyes. Depth perception depends largely on the use of both eyes, especially in dim light.

d. *The Pointing Technique.* This technique means just what its name implies. The rifleman makes no attempt to aim with the sight; he points the rifle at the target. When he does this with his head held high and both eyes open, the average firer unconsciously raises the muzzle until it seems to intersect his line of sight to the target (fig. 109). This causes him to fire high. To correct this, he deliberately depresses the muzzle of the weapon by adjusting the position of the left hand under the rifle. The tendency of right handed firers to fire to the left before training, and left handed firers to fire to the right, is eliminated by the pointing technique. Assure the rifleman that, with practice, he will learn the "feel" of a correctly pointed weapon (fig. 110) and will be able to fire effectively with the pointing technique. A

rifleman trained in the pointing technique demonstrates it for the class.

e. Trigger Control. A proper firing position and trigger control will produce effective results. Jerking the trigger or flinching causes the firer to move the muzzle of the weapon. A change of one inch in the direction the muzzle is pointing will move the strike of a bullet about 50 inches at a range of 50 meters. Emphasize this to the rifleman.

f. Use of the Flash Hider. The flash hider greatly reduces the effect of muzzle flash on the rifleman's night vision. This increases the rate of fire.

g. Practice in Prone Position. The rifleman practices the pointing technique in the prone firing position because this position most closely approximates most supported firing positions. With the head and eyes close to the ground, more obstacles are likely to appear in the field of vision and target detection presents its greatest challenge. The pointing technique is adaptable to all other firing positions.

114. Organization and Conduct of Firing (Superseded)

a. Equipment.

- (1) One M target per firing point.
- (2) Three spotters per target.
- (3) White chalk for marking hits.
- (4) One empty ammunition clip per firing point.

- (5) Ambulance.
- (6) Public address set.

b. Control Personnel.

- (1) Officer in charge of firing.
- (2) One safety officer per 20 firing points.
- (3) One assistant per 5 firing points.
- (4) One order to act as coaches.

c. Conduct of Firing.

- (1) The officer in charge of firing commands the firers of the first firing order to assume the prone position at their assigned points on the firing line.
- (2) The assistants and the coaches see that the riflemen use the correct position, giving them plenty of time to make adjustments. The men assume the normal prone position, holding the rifle as usual, the left elbow well under the weapon and the butt firmly against the shoulder. The head is held high so that the eyes are well above the line of the sights. Placing the chin slightly above the comb of the stock will position the head correctly.
- (3) The assistants issue ammunition on order. The firers load partial clips to avoid having to change their firing positions between rounds of a shot group.
- (4) Each rifleman fires five 3-round shot groups at the M target at a range of 50 meters (app. II, table VII). After firing each shot group, the firers move to the targets, on order, and the assistants cri-

tique the new shot groups. Spotters are put on the new shot groups, old shot groups are chalk-marked, and the firers return to the firing line.

- (5) Assistants and coaches help the firers to adjust their shot groups by having them shift the body position or adjust the position of the rifle muzzle. Initially, the firers try to get good shot groups and then move the groups toward the center of mass of the target. In this way, they get the "feel" of the pointing technique.

Section V. APPLICATION NIGHT FIRING AND NIGHT RECORD FIRING

(Superseded)

115. Application Night Firing

(Superseded)

Table VI (app. II) is fired once for practice. The range is organized and firing is conducted like orientation night firing except that the riflemen use the technique of night firing. A critique after firing gives the riflemen an opportunity to discuss individual problems which may remain.

116. Record Firing

(Superseded)

Table VI is fired for record. Night record firing is conducted like application night firing except that it is scored. Each hit on the target is counted as 5 points and the scores are entered on the firer's qualification card. The maximum score attainable is 80 and the minimum proficiency is 25.

CHAPTER 7

SNIPING

(Rescinded)

138. General

A fire unit * * * the rifle squad." The squad leader uses his fire team leaders to assist him in the training and operational control of the squad.

141. Methods of Determining Range

(Superseded)

Range can be determined by such means as measuring on maps or with ranging instruments, but in combat, the rifle squad most frequently uses the 100-meter unit of measure and the appearance of objects. To become fully proficient, riflemen must practice both of these methods on varied terrain and under various conditions of light and weather so they can learn how these conditions affect their estimates.

142. 100-Meter Unit of Measure

(Superseded)

a. To use this method the rifleman must be able to visualize a 100-meter distance on the ground. With this unit in mind, he can mentally determine how many of these 100-meter units there are between his position and the target. In training, estimates should be checked by pacing off the distance. (The average man takes about 130 steps per 100 meters.) Constant practice in applying the 100-meter unit of measure is essen-

tial. This method is used for ranges up to 500 meters (fig. 120).

b. For ranges from 500 meters up to and including 1,000 meters, the rifleman selects the halfway point to the target, estimates the range to the halfway point by applying the 100-meter unit of measure, then doubles the estimate (fig. 121).

c. Certain factors affect the appearance of 100-meter units of measure on the ground. For example, on terrain that slopes upward toward the target, 100 meters appear longer than on level terrain; on ground that slopes downward toward the target, 100 meters appear shorter than on level terrain.

142.1. Appearance of Objects (Added)

a. Many times, the topography and vegetation will make it impossible to observe most of the terrain to the target. In this case, it is impractical to apply the 100-meter unit of measure and ranges must be determined by the appearance of objects method; that is, by learning through much practice how certain objects look at 100 meters and at greater distances. For example, the rifleman studies the appearance of a man when he is standing 100 meters away. He fixes his appearance firmly in mind: his size and the details of his uniform and equipment. Next, he studies the man in the kneeling position, then in the prone position. By comparing the appearance of the man in these positions at known ranges from 100 to 500



Figure 120. (Superseded) Applying the 100-meter unit of measure for ranges up to 500 meters.

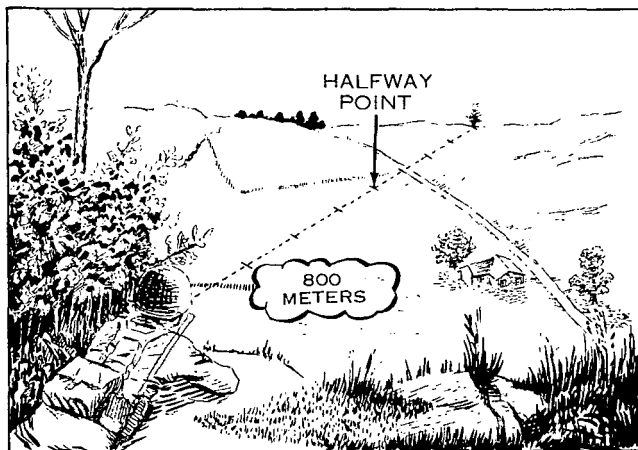


Figure 121. (Superseded) Applying the 100-meter unit of measure for ranges greater than 500 meters.

meters, he can establish a series of mental images that will help him to determine range on unfamiliar terrain.

b. Training may be conducted to familiarize the rifleman with the appearance of other familiar objects, such as weapons and vehicles.

c. Certain factors affect the appearance of objects, and an understanding of them will help to make estimates more accurate. See table II.

d. See section III, appendix II, for range determination exercises.

143. Determining Range by Observing the Strike of Ball or Tracer Ammunition (Rescinded)

149. Organization of the Rifle Squad (Superseded)

The rifle squad consists of the squad leader and two fire teams designated as Alfa and Bravo teams. Each fire team consists of a team leader, three riflemen, and one automatic rifleman. To facilitate training in technique of fire, the riflemen of each team should be numbered 1, 2, and 3.

150. Duties of Members of the Rifle Squad

The squad leader * * * a fighting team.

* * * * *

b. The riflemen perform the following duties during a fire fight:

* * * * *

(5) (Superseded) One rifleman in each team is designated to assist the automatic

rifleman of his team. He carries extra ammunition for the automatic rifleman and is prepared to assist him by rifle fire if the automatic rifle develops a malfunction. If the automatic rifleman becomes a casualty, the rifleman takes his place.

* * * * *

151. Marksmanship

In known-distance firing * * * targets, accurate leads.

* * * * *

a. Aiming Point. (Superseded) The rifleman will not normally make sight changes during combat. He will have to use the battle sight and adjust his point of aim on the target (fig. 128). These aiming points are used whether the enemy soldier is standing still or moving directly toward or away from the rifleman. A rifleman will rarely engage an enemy soldier at a range greater than 300 meters, but if he does, he should take time to adjust his sight or determine the amount of hold-off necessary to hit the target. He must remember to use the aiming techniques he learned in his marksmanship training.

b. Leads. A lead is one target width. When engaging a * * * moving target meet.

(1) (Superseded) To engage a walking man at ranges less than 250 meters, he aims at the forward edge of his body; at ranges over 250 meters, he leads him by the width of his body, which is one lead

(fig. 129). If the man is running, he adds one lead.

* * * * *

152. Methods of Applying Squad Fire (Superseded)

In combat, the size and nature of a target may call for the firepower of the entire squad or only part of it. The fire may be directed at a point or distributed along a line or over an area.

a. *Concentrated fire* is a heavy volume of fire directed at a point target such as an automatic weapon or enemy concentration. Concentrated fire may be delivered by the entire squad or only part

USING BATTLE SIGHT AGAINST PERSONNEL

250 - 350
METERS
AIM HERE

175 - 250
METERS
AIM HERE

75 - 175
METERS
AIM HERE



Figure 128. (Superseded) Aiming point.

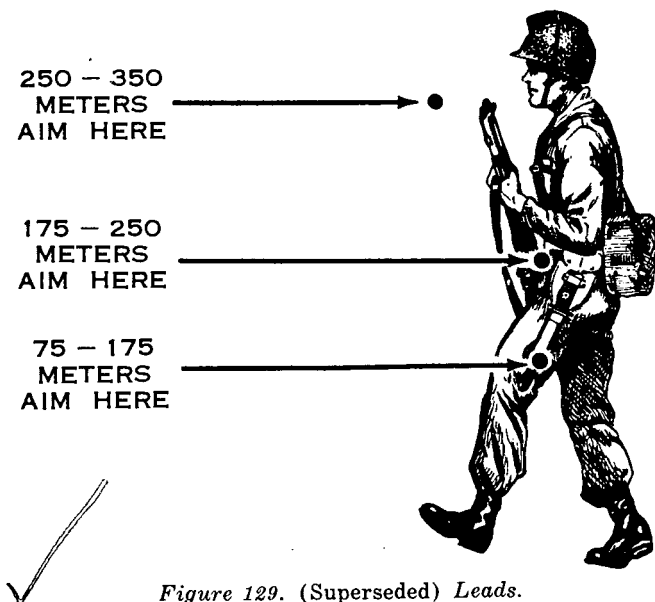


Figure 129. (Superseded) Leads.

of it. The automatic riflemen attempt to fire alternately in bursts to insure a continuous volume of fire on the target and continued operation of their weapons.

b. *Distributed fire* is fire that is distributed in width or depth so that a wide or deep target can be effectively covered.

- (1) *Distribution of fire on a target in width.*
The squad leader designates the center and flanks of a wide target unless the target is obvious. Each fire team usually covers half of it (fig. 130), but the terrain may dictate that one team cover a

larger portion than the other. The normal deployment from the squad's combat formations places the Alfa team on the right and the Bravo team on the left. The riflemen fire initially on that portion of the target corresponding to their position in the teams (fig. 131). For example, the left flank rifleman fires initially on the left flank portion of his team target, overlapping the known flank of the target and the rifleman on his right. The center rifleman fires on the center portion of his team target, overlapping his fire with the adjacent riflemen on his right and left. The right flank rifleman fires on the right portion of his team target, overlapping with the rifleman on his left and the fire team on his right. The riflemen fire at known or suspected enemy in their portion of the team target. After destroying all known or suspected enemy in their portion of the target, the riflemen may then fire at known or suspected enemy anywhere in the team target. The automatic riflemen fire at enemy automatic weapons located anywhere in the squad target. If there are no enemy automatic weapons, the automatic riflemen begin firing just outside the flanks of their team target. Firing in short accurate bursts at known or suspected enemy, they distribute their fire across the team target, overlapping

at the center. After fire superiority has been gained, the automatic riflemen fire at known enemy or other targets as the squad leader or fire team leader may direct. The fire team leader is a fighter-leader and normally engages in the fire fight. He distributes his fire on the team target where he feels it will be the most effective. The team leader makes frequent checks with the squad leader for signals and instructions, and is responsible for adjusting his team's fire or shifting it, if necessary, to any portion of the squad's target.

(2) *Distribution of fire on a target in depth.*

Unless the target is obvious, the squad leader designates its center, front, and rear. By SOP learned in training, one fire team covers the front half and the other team covers the rear half. In some situations the SOP may have to be changed because of the terrain, location of the target, or the disposition of the squad.

(3) *Distribution of fire during fire and maneuver.* When the squad advances by fire and maneuver, the squad leader designates a maneuver element and a fire support element. The fire support element must cover the entire squad target and maintain fire superiority, while the maneuver element advances. If possible, fire team integrity is main-

tained, one team being designated as the fire support element and the other as the maneuver element. The squad leader may change the composition of his two teams if he feels it is necessary. For example, he may use both AR's as the fire support element and maneuver with the remainder of the squad. During the advance to the objective, members of the maneuver element may have to rush in-

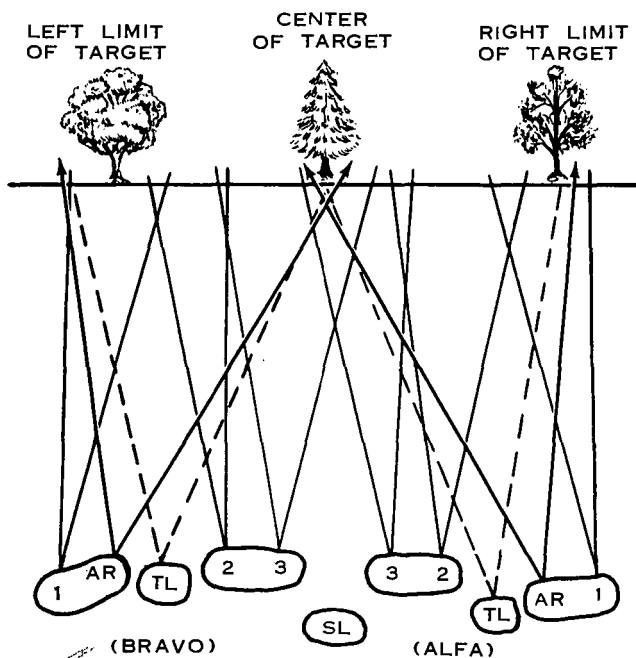


Figure 131. (Superseded) Initial individual distribution of fire on a wide target.

dividually, supported by the fires of other members.

c. Area Fire. Area fire is fire distributed in depth and width. It is effective in smothering and neutralizing an area. It is used when the enemy is known to be in a certain area, but his specific location cannot be observed. Each rifleman fires his sector in depth and width, firing at suspected enemy locations. The automatic riflemen distribute their fire on likely targets in the team sector with priority to enemy automatic weapons.

d. Assault Fire. Assault fire is a violent and heavy volume of fire by assault elements as they close with the enemy. Its purpose is not only to kill or wound the enemy, but to terrify and demoralize him. It keeps him deep in his hole where the shock effect of the supporting fires puts him—hugging the ground with his weapon idle—or it forces him into a hurried and disorderly retreat. When attacking troops reach the assault line, they are deployed in line formation and advance at a rapid walk toward the objective. The riflemen, with bayonets fixed, deliver a heavy volume of fire by firing aimed shots from the shoulder every two or three steps without pausing. When the riflemen are within 30 to 35 meters of the objective, they shift to the underarm position and fire well-directed shots at suspected enemy locations. Throughout the assault, the riflemen fire at every location in their zone of advance that might conceivably contain an enemy. When an enemy exposes himself or when a definite target appears, the riflemen may fire aimed shots

from the shoulder. The automatic riflemen carry their weapon slung from the left shoulder and fire from the hip firing position. The automatic rifle is a difficult weapon to operate during the assault. The automatic riflemen must have a thorough knowledge of and repeated practice in the techniques of its operation (FM 23-15). By fastening two slings together and looping one end over the outside of the stock, with the other end passing over the carrying handle to the upper sling swivel, the weapon will hang in the firing position while the gunner uses both hands to reload. He should carry his magazines in his ammunition belt with the open end down and the long side to the rear. This makes them easy to remove from the belt and place in the receiver. In removing an empty magazine from the weapon, the gunner presses the magazine release with the thumb of one hand and removes the magazine with his other hand. He places the empty magazines in his shirt or in an ammunition bag. He must keep the magazines because they are a part of the weapon, and it will not fire automatically without them. To cover the squad front during the assault, the automatic rifleman fires a short burst at known or suspected enemy locations every two or three steps as his left foot strikes the ground, and reloads while moving steadily forward. The squad leader moves at the rear of the squad to enforce the continuity of fires and to control squad alignment. Team leaders participate in the assault firing and assist in controlling the squad by setting

the example and by taking action as fighter-leaders.

e. Rate of Fire. The maximum effective rate at which any rifleman can fire an M1 is determined by his ability to align the sights, squeeze the trigger, and reload rapidly. To fire in excess of his accurate fire rate is a waste of ammunition. The maximum effective rate of fire for the automatic rifle is 120 to 150 rounds per minute. The sustained rate of fire is 40 to 60 rounds per minute. The sustained rate must be used when the weapon is in operation for long periods, to keep the barrel from overheating. Both the riflemen and automatic riflemen should fire their first few rounds, particularly in the case of surprise fire, at the maximum effective rate in order to gain fire superiority. Thereafter, the rate should be decreased to the point that will maintain fire superiority. This reduction in the rate of fire is necessary to insure continued operation of the weapons and to conserve ammunition; it is accomplished either on command of the squad leader or by following squad SOP.

155. Elements of the Fire Command

The squad leader * * * to open fire.

* * * *

b. Direction. This element indicates * * * the following ways:

* * * *

~~(3)~~ (Superseded) *Use of tracer ammunition.*

Using tracer ammunition is a quick and

sure method of indicating the direction to an indistinct target and is most accurate for pinpointing the flanks of an obscure target. When using this method, the squad leader should first give the general direction orally to direct the squad's attention to the desired area. Firing tracer ammunition to designate targets has these disadvantages: it may disclose the squad's presence and position and reduce the surprise effect of the squad's fire. To minimize these disadvantages when using tracer ammunition to indicate direction or to designate targets, the squad leader should not fire until he has given the other elements of the fire command. The firing of the tracer then becomes a part of the last element of the fire command and is the signal to open fire, for example—

SQUAD
FRONT
LINE OF RIFLEMEN
THREE HUNDRED
WATCH MY TRACER

(Fires 1st round at center)
(Fires 2d round at right flank)
(Fires 3d round at left flank)

The squad fires.

(For additional examples see paragraph 157.)

- (4) (Superseded) *Reference points.* To help the members of the squad locate an invis-

ible or indistinct target, the leader can use an easily recognizable reference point that is nearby. Prominent landmarks and terrain features make good reference points. The squad leader must be familiar with the terrain features and the terminology used to describe them (FM 21-26). When using a reference point, the word "REFERENCE" precedes its description and the word "TARGET" precedes the target description. This prevents the squad from confusing the two. Here are some examples of the use of the reference points—

NUMBER 1 ALFA

FRONT

REFERENCE: Dead tree in draw.

TARGET: Sniper.

AR'S

LEFT FRONT

REFERENCE: Truck in barnyard, at a lesser range.

TARGET: Machinegun.

BRAVO TEAM

RIGHT FRONT

REFERENCE: Crossroads, right to grassy mound.

TARGET: Patrol.

When using a reference point, always give the general direction to it and the range to the target. Sometimes you can

best designate a target by using successive reference points; for example—

SQUAD

LEFT FRONT

REFERENCE: Stone house, right to
small barn, right to
haystack.

TARGET: Machinegun.

Finger measurement (par. 144) can be used to direct the squad's attention to the right or left of a reference point; for example—

SQUAD

FRONT

REFERENCE: Lone pine tree, right
two fingers.

TARGET: Machinegun.

* * * * *

e. (Superseded) *Method of Fire*. This element tells which members of the squad are to fire at the target. If the squad leader wants the same men to fire that he alerted, it may be omitted. He can give this information using any method that he might use to alert them. If any ammunition allotment is necessary, it is also announced in this step; for example—

SQUAD

FRONT

AUTOMATIC WEAPON

THREE HUNDRED

AR'S, 2 MAGAZINES.

The squad leader normally does not limit the amount of ammunition to be fired but rather depends upon his ability to control the fires of his squad to insure proper ammunition expenditure. ~~b.~~ (Superseded) *Command to Open Fire.* The squad may be required to open fire on command or signal. If surprise fire is not required, the command FIRE is given without a pause after the last element. If the squad leader wants all the men to open fire at once for surprise and shock effect he precedes the command or signal to fire with the words AT MY COMMAND or AT MY SIGNAL. When all the men are ready, he commands or signals, FIRE: for example—

SQUAD
FRONT
AUTOMATIC WEAPON
THREE HUNDRED
AR'S, 1 MAGAZINE
AT MY COMMAND
FIRE.

156. Example of Oral Fire Commands

It is not * * * reacting to them.

* * * * *

~~b.~~ (Superseded) In the example below, the squad leader desires to designate the target to his entire squad but wants only the automatic riflemen to engage it. The target is indistinct. Note the use of a reference point—

SQUAD
LEFT FRONT

REFERENCE: Red barn, right two fingers.
TARGET: Automatic weapon.
FOUR FIVE ZERO
AR'S
FIRE.

* * * * *

157. Examples of Other Fire Commands (Superseded)

The following examples show the use of different methods of control. Some of the elements are implied. Because of the situation, these commands are informal, but they are effective.

a. In the following example, the squad leader desires to place the fire of the entire squad on an automatic weapon that has opened fire on the squad from about 300 meters.

Squad leader commands, WATCH MY FIRE
Squad leader engages target.
Squad fires.

b. In the example below the squad leader desires to have the No. 1 rifleman, Bravo team, engage an enemy rifleman exposed to the squad's front.

Squad leader throws rock at No. 1 rifleman, Bravo team.

No. 1 looks at squad leader.

Squad leader points to target and commands or signals, THREE HUNDRED.

No. 1 acknowledges target, aims, and fires.

c. Assume that the squad is engaging a target and that the squad leader wants to shift the fire

of the automatic riflemen onto a new target without interrupting the riflemen's fire.

- (1) The squad leader calls to the Bravo team leader, signals that the automatic rifleman is to fire, and points to the new target.
- (2) The team leader acknowledges the signal and has his automatic rifleman engage the target.
- (3) The squad leader moves to the Alfa team automatic rifleman, points out the new target, and commands, FIRE!

d. The squad leader wants to place the fire of the No. 2 and No. 3 riflemen, Alfa team, on two enemy riflemen running toward a ditch to the front. The squad leader commands—TWO AND THREE, ALFA TEAM—THOSE MEN, FIRE!

e. The squad leader wants the squad to engage an area target. The squad leader commands, WATCH MY FIRE. He marks the flanks and depth of the target by firing tracer ammunition. The squad fires.

158. Standing Operating Procedures

Standing operating procedures * * * in paragraph 152. While firing, **team members** must frequently glance at their fire team leader for instructions; the fire team leaders also check frequently with the squad leader. **Another SOP the squad should use is: when the squad receives effective fire from the enemy, return fire without order. If the squad leader designates a target by**

firing at it, the squad members should fire as soon as they locate the target. Many other matters, such as signals and administrative details, can be included in an SOP. By intensive training and by developing SOP's, the squad can be trained to take care of many situations with a minimum of leader direction and control.

163. Conduct of Training

* * * * *

b. Integrated Training. Field target problems * * * and tested also.

- (1) *Marksmanship training.* The squad must * * * fire more accurate. The battle sight should be used throughout the field firing exercises. To simulate actual * * * checked or redetermined.

* * * * *

169. Procedure for Conducting Firing Exercises

Landscape target firing * * * the following procedure.

a. Ammunition is distributed as follows:

* * * * *

- (3) Riflemen and team leaders receive 4 rounds each.
- (4) Automatic riflemen receive 9 rounds each.

* * * * *

173. Range Construction (Superseded)

The squad defensive night firing range can be

constructed on any fairly level piece of terrain that is approximately 100 meters square and allows 180° firing and safety limits for small-arms firing. It consists of a firing line, 4 demolition pits, 20 black E type pop-up targets 20 meters from the firing line, 5 black E type flashing targets 80 meters from the firing line, and 2 loudspeaker pits to broadcast simulated battle noises over a public address system (figs. 140 and 144). Pop-up targets may be added at various ranges up to 75 meters if the training is conducted when there is more than quarter-moon illumination.

175. Day Instruction Firing

* * * * *

b. Techniques of Applying and Controlling Fire.

The points discussed * * * the following techniques.

(1) Sector of search.

- ✓ (a) (Superseded) Within the squad's sector of fire, the members of the rifle squad are assigned sectors of search by employing a technique similar to that used during daylight. Each rifleman searches the portion of the squad's sector that corresponds to his position in the squad (fig. 142). Because of limited visibility at night, this technique is modified to insure overlap between individual sectors (and squad sectors) within the limit of visibility. The squad leader may assign each team leader a specific sector of search. If not, the team leaders supplement

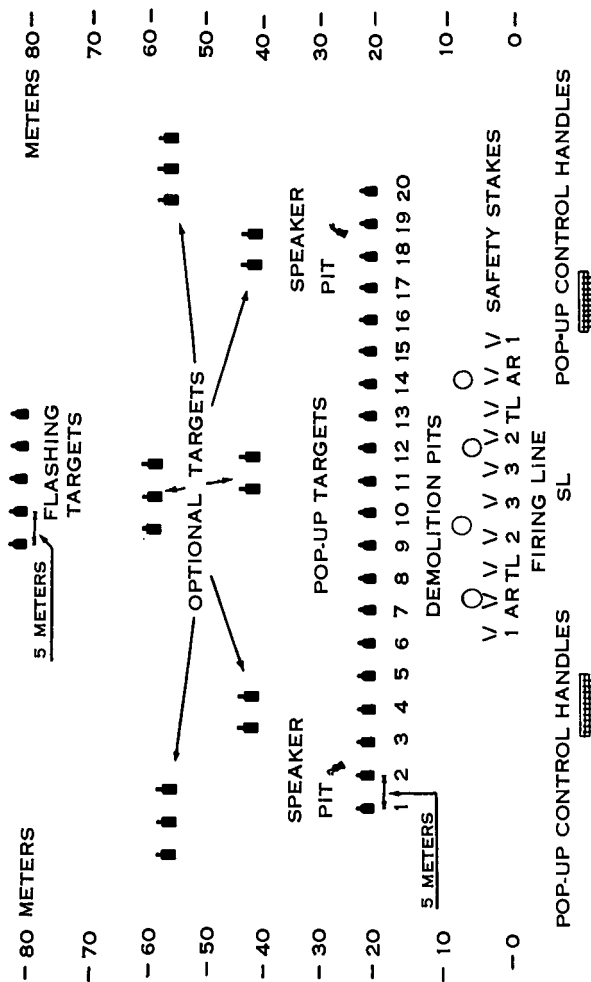


Figure 140. (Superseded) Range diagram. (The 20-meter bank of targets may be reduced in number and additional targets installed at increased ranges (par. 173).)

the riflemen by searching their teams' portions of the squad's sector. Each automatic rifleman searches the entire squad sector unless he is directed to search his principal direction of fire. In a combat situation, the terrain, mission, size of the squad, and other factors may require readjustment of the size of the sectors. Sectors may be staked off in some way, but it must be

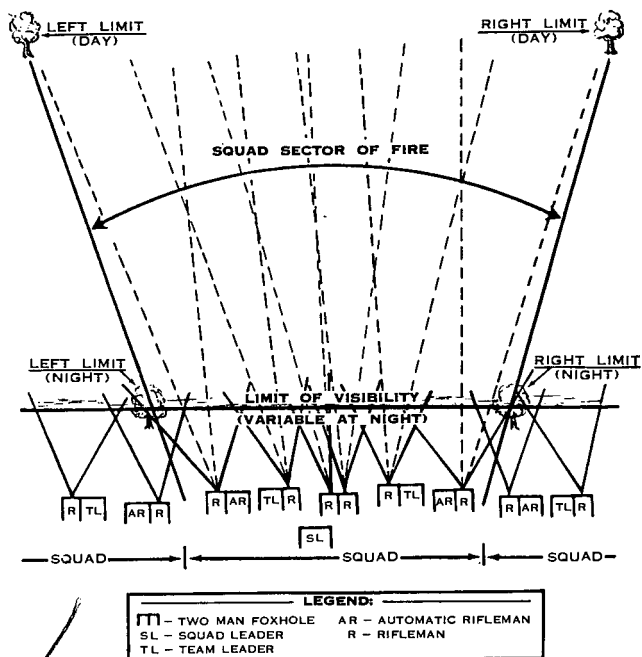


Figure 142. (Superseded) Typical readjustment of individual sectors of search for night combat.

pointed out that any markers that are more than a few meters away may be invisible at night.

* * * * *

177. Squad Defensive Night Firing Proficiency Course

* * * * *

~~b.~~ (Superseded) *Proficiency Range*. The range consists of a firing line containing foxholes for the squad members; 10 demolition pits forward of the squad position and 2 to the rear; 3 banks of 5 black E type pop-up silhouette targets each, at ranges of 15, 25, and 50 meters to the right front, and 3 banks at ranges of 15, 25, and 35 meters to the left front of the squad position; 3 black E type flashing targets at a range of 75 meters to the front of the squad position; 2 black E type flashing targets at a range of 200 meters, 1 to the right front and 1 to the left front of the squad position; 2 additional flashing targets are installed at 50 to 75 meters, 1 as far to the right and 1 as far to the left as the safety limits will permit; and 2 loud-speaker pits to the squad front and 1 to the squad rear (fig. 144).

c. Conduct of Firing. The instructor tells * * * the following sequence:

* * * * *

(3) (Superseded) After a brief silence, the two flashing targets at the **200-meter** range are activated for **30 seconds**, accompanied by a synchronized recording of machinegun fire.

- (4) (Superseded) The three flashing targets at the **75-meter** range are activated for 45 seconds, accompanied by a synchronized recording of machinegun fire.

* * * * *

- (6) The three banks * * * with the position. **During this operation, the left flashing light should be activated periodically.**

* * * * *

181. Instruction Firing

* * * * *

b. *Requirements.* The squad must * * * off the target.

- (1) *Firing position.*

* * * * *

- (b) (Superseded) The automatic riflemen use the **hip firing** position, the same position they use in a daylight assault. This position is described in FM 23-15.

- (2) *Speed of movement and maintaining alinement.*

- (a) (Superseded) The squad moves as fast as possible, consistent with its ability to maintain alinement and to fire accurately. A base man within the squad is designated for the squad members to dress on so they can regulate their speed of movement. They must not stop for any reason once the assault begins. During squad training, the

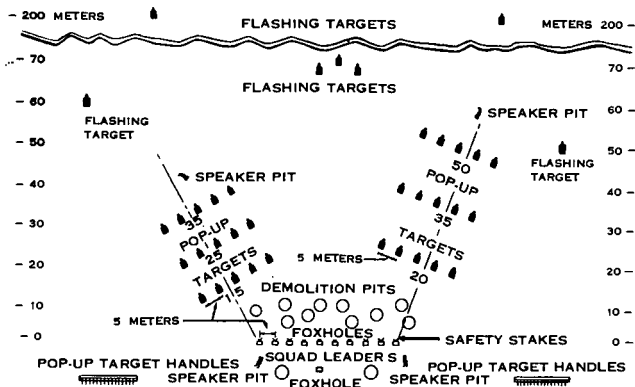


Figure 144. (Superseded) Proficiency range.

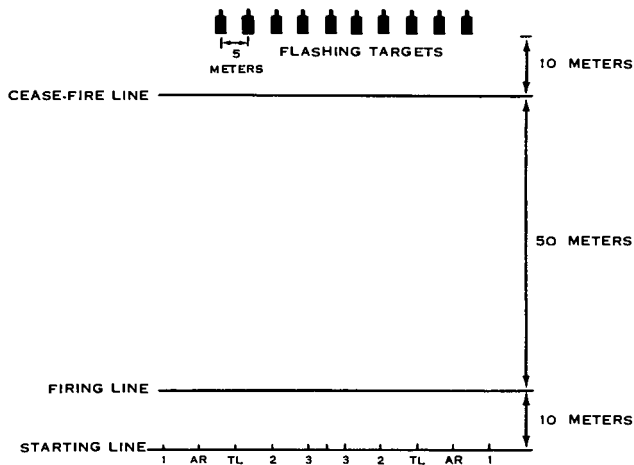


Figure 146. (Superseded) Range for squad assault night firing instruction.

center rifleman should be designated as the base man.

(b) (Superseded) An SOP or visual interval must be established between men. A visual interval between men is maintained under the darkest conditions. The interval can be increased as visibility increases.

(c) (Superseded) The squad is fully deployed in the assault to bring its maximum firepower to bear on the objective area. To keep this alinement during the assault, each man senses the position of the men to their right and left by the muzzle flashes of their weapons.

(3) *Reloading.* The men must * * * sense of touch. **Each rifleman should listen for the "ping" of the empty clip as it is ejected from the receiver so that he will know his weapon is empty and not attempt to fire again. The key to rapid loading is PRACTICE, PRACTICE, and more PRACTICE under all conditions, both day and night.**

(4) *Keeping the fire down* (Superseded). The rifleman can overcome the tendency to fire high from the underarm position at night by boldly depressing the muzzle of his weapon when he fires. The tendency can be further corrected by using tracer ammunition in practical exercises so each man can see where he is firing

and adjust his fire. Tracer ammunition is recommended for use in the night assault in combat because it—

- (a) Aids the firer in adjusting his fire.
- (b) Tends to illuminate the objective area.
- (c) Has a demoralizing effect on the enemy.

✓ (5) *Fire distribution* (Superseded). Each rifleman fires at known or suspected enemy locations on the portion of the objective that corresponds to his position in the assault line. Each automatic rifleman covers the entire squad objective. His primary target is automatic weapons. If there are no enemy automatic weapons he also fires at known or suspected enemy locations. Normally, the team leaders move in the assault line in the center of their teams and fire to increase the firepower of the squad.

c. Practical Exercises.

✓ (1) *Dry exercise.* The men are deployed on the starting line (fig. 146) and told that they will practice dry runs to get more experience using the underarm/hip-firing position and to learn the speed of movement necessary to maintain squad alinement. Dress is on the base man and there is a 5-meter interval between men. The squad leader gives the command to move out and the squad advances, simulating fire from the underarm/hip-firing

position as it moves to the cease-fire line.
The squad is * * * runs is recommended.

* * * * *

APPENDIX II

FIRING TABLES AND EXERCISES


Section I. RIFLE FIRING COURSES

2. Combat Qualification Course

a. Scores. The rifleman's qualifications * * * tables IV, V, and VI. See paragraph 81b and c for exceptions to this requirement. A summary of the scores is listed below:

* * * * *

Table VII. Combat qualification course, day instruction firing, night firing. (Total rounds—15.)

Range (meters)	Time	Rounds	Position	Target
 50	****	15	Prone	1 "M"

NOTES

1. This table is not scored.
2. Each rifleman fires five 3-round shot groups at the target. Each group is checked and spotted after firing.

3. Alternate Qualification Course

(par. 81c)

(Superseded)

a. Scores. The rifleman's qualification classification is determined as indicated by the scores below:

Possible	-----	250
Expert	-----	202
Sharpshooter	-----	175
Marksman	-----	150

b. *Ammunition.* The following ammunition is required:

Practice firing	-----	59 rounds
Record firing	-----	50 rounds
Total		109 rounds

c. *Firing Table.* The alternate qualification course firing table is fired on the 25 meter (1000 inch) range. When this range is not available, the table may be fired at 180 meters (200 yards).

Firing Table—Alternate Qualification Course

Time limit	Rounds	Position
None	9*	Prone (for zero)
8 minutes	8	Prone
8 minutes	8	Sitting
8 minutes	8	Kneeling or squatting
8 minutes	8	Standing
50 seconds	9	Sitting (rapid)
50 seconds	9	Prone (rapid)

*Fired for practice only. Use of a sandbag is optional. The rifle is zeroed by the single-shot method (par. 75).

Section II. SNIPER EXERCISES

(Rescinded)

Section III. RANGE DETERMINATION EXERCISES

Change the word "yard(s)" to "meter(s)" throughout this section.

APPENDIX VIII

METRIC AND STANDARD MEASUREMENT EQUIVALENTS

(Rescinded)

(Added)

1 centimeter = 0.3937 (0.39) inch

1 decimeter = 3.937 (3.94) inches = 0.328
 (0.33) feet
 1 meter = 39.37 (39.4) inches = 1.0936
 (1.09) yards
 1 km = .62 mile
 1 inch = 2.54 centimeters
 1 foot = 30.48 centimeters
 1 yard = 0.9144 meter
 1 mile (1,760 yds) = 1.61 km
 1,000 inches = 27.77 (27.8) yards
 1,000 inches = 25.3929 (25.4) meters

75 yards = 68.58 meters
 100 yards = 91.44 meters
 200 yards = 182.88 meters
 250 yards = 228.60 meters
 300 yards = 274.32 meters
 400 yards = 365.76 meters
 500 yards = 457.20 meters
 600 yards = 548.64 meters
 1,000 yards = 914.40 meters

75 meters = 82.02 yards
 100 meters = 109.36 yards
 200 meters = 218.72 yards
 250 meters = 273.40 yards
 300 meters = 328.08 yards
 400 meters = 437.44 yards
 500 meters = 546.80 yards
 600 meters = 656.16 yards
 1,000 meters = 1,093.60 yards

To change inches to meters: multiply (inches) x
 .0254

To change feet to meters: multiply (feet) x .3048
 To change yards to meters: multiply (yards) x .9144

Formula for finding the chord subtended by a minute of angle (1 click) :

$$\begin{array}{ll} 360 \text{ degrees} & C = 2\pi r \\ \times 60 \text{ minutes} & C = 2 \times 3.1416 \times \text{radius} \\ \hline 21,600 \text{ minutes in a circle} & C = 6.2832 \times r \end{array}$$

$$6.2832r \div 21,600 = \frac{6.2832}{21,600} r = .000291r$$

if r is 100 yards (3,600 inches), one minute at that distance will be:

$$3,600 \times .000291 = 1.0476 \text{ inches}$$

M1 rifle (Rear sight change, one click = approx 1 minute of angle)

1 click = 2.66 centimeters @ 100 yards or 91.44 meters

1 click = 2.9 centimeters @ 100 meters

1 click = .65 centimeter @ 1,000 inches

1 click = .7 centimeter @ 25 meters

1 minute change = range in meters x .0291 = centimeters moved

1 minute change = range in yards x .0266 = centimeters moved

1 minute change = range in meters x .0115 = inches moved

1 minute change = range in yards x .0105 = inches moved

By Order of *Wilber M. Brucker*, Secretary of the
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☆ United States Government Printing Office: 1960—520536

*FM 23-5

FIELD MANUAL

No. 23-5

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 26 September 1958

U. S. RIFLE, CALIBER .30, M1

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*This manual supersedes FM 23-5, 2 October 1951, including C 1, 17 November 1954, and C 2, 1 July 1955, and TC 23-1, 24 February 1955.

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PART ONE
THE M1 RIFLE; ITS MECHANICS AND CARE
CHAPTER 1
INTRODUCTION

1. Purpose and Scope

This manual is a guide for rifle instructors in the principles and techniques for developing combat riflemen who can deliver effective fire both as individuals and as members of rifle squads. It covers mechanical training and maintenance of the rifle; marksmanship training from the preparatory phase through known-distance firing, combat firing, night firing, and sniping; squad techniques for day and night firing; and the techniques of coaching. The manual includes only the material needed to conduct the various phases of training. Additional background information can be found in the references listed in appendix I.

2. Description of the Rifle

a. The M1 rifle is a clip-fed, gas-operated, air-cooled, semi-automatic shoulder weapon (fig. 1). This means that the rifle is loaded by inserting a metal clip (containing a maximum of eight rounds) into the receiver; that the power needed

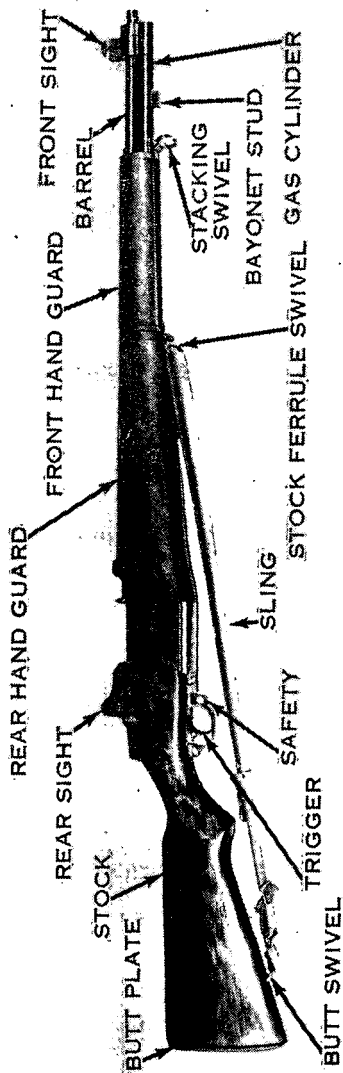


Figure 1. U. S. Rifle, caliber .30, M1.

to cock the rifle and chamber each succeeding round comes from the expanding gas of the previous round; that the air cools the barrel; and that the rifle fires one round each time the trigger is squeezed. The weapon weighs approximately 9½ pounds. With the bayonet attached it weighs an additional pound.

b. The rifle has a fixed front sight and an adjustable rear sight that can be moved up or down and right or left to adjust for long or short ranges and for the force of a wind that might otherwise blow the bullet off its course to the target.

c. The *maximum effective range* of the rifle is considered to be 500 yards. A battlefield target beyond 500 yards is hard for the average rifleman to detect and hit.

d. When the trigger is squeezed, a round is fired, the empty cartridge case is ejected, the hammer is cocked, a new round is inserted into the chamber, and the rifle is ready to fire again—all in a fraction of a second. This fast mechanical action allows a rifleman to deliver a large number of aimed shots in a very short time. Although there is no set maximum effective rate of fire, a trained rifleman can fire 16 to 24 aimed rounds a minute.

3. Ammunition

a. The types of authorized rifle ammunition are listed below together with their use and identifying characteristics.

- (1) Ball—for use against personnel and light material targets, and for marksmanship training. It has no identifying marks.

- (2) Armor-piercing—for use against light armored vehicles, protective shelters, and personnel. The tip of the bullet is painted black.
- (3) Armor-piercing-incendiary—for use in place of the armor-piercing round and against inflammable targets. The tip of the bullet is painted aluminum.
- (4) Tracer—for use in observing fire and signaling, and for incendiary purposes. The tip of the bullet is painted orange.
- (5) Blank—used for simulated fire and for signaling and firing salutes. The cartridge has no bullet and the mouth is not crimped.
- (6) Rifle grenade cartridge—used with the grenade launcher to propel grenades. The cartridge has no bullet; however, the mouth is crimped.
- (7) Dummy—for use in mechanical and marksmanship training. It can be identified by the three holes in the cartridge and by the absence of a primer. Older models can be identified by the six longitudinal flutes along the side of the cartridge.

b. For detailed information on this ammunition, see TM 9-1990.

CHAPTER 2

MECHANICAL TRAINING AND MAINTENANCE

Section I. DISASSEMBLY AND ASSEMBLY BY INDIVIDUALS

4. General

a. The individual soldier is authorized to disassemble his rifle to the extent called *field stripping*. The disassembly chart shows the parts he is permitted to disassemble without supervision. This amount of disassembly is necessary for normal maintenance.

b. The rifle should be disassembled and assembled only when required for instructional purposes or for proper maintenance. Repeated assembly and disassembly causes excessive wear of parts that soon make them unserviceable and reduces the accuracy of the weapon. It is impossible to fire effectively with an inaccurate rifle and any loss of effectiveness lessens a soldier's confidence in himself and his weapon.

c. The rifle has been designed so that it may be taken apart and put together easily. No force is needed if it is disassembled and assembled correctly. The parts of one rifle should not be interchanged with those of another unless it is absolutely necessary. To do this may change the zero

and affect the rifle's operating efficiency. Ordnance personnel only may interchange bolts.

d. As the rifle is disassembled, the parts should be laid out on a clean surface, in order, from left to right. This makes assembly easier because the parts are assembled in the reverse order of disassembly. The names of the rifle parts (nomenclature) should be taught along with disassembly and assembly to make future instruction on the rifle easier to understand.

5. Disassembly into the Three Main Groups

a. The three main groups are the trigger housing group, the barrel and receiver group, and the stock group (fig. 2).

b. To disassemble the rifle into the three main groups, first cock it by pulling the operating rod handle to the rear and then allowing it to go forward. Grasp the rifle with the left hand so that the base of the trigger housing is included in your grip. Place the rifle butt against your left thigh, sights to the left. With the thumb and forefinger of your right hand, pull downward and outward on the trigger guard. Swing the trigger guard out as far as it will go and lift out the trigger housing group (fig. 3).

c. With your left hand, grasp the rear of the receiver and raise the rifle. With your right hand, give a downward blow, grasping the small of the stock. This will separate the stock group from the barrel and receiver group.

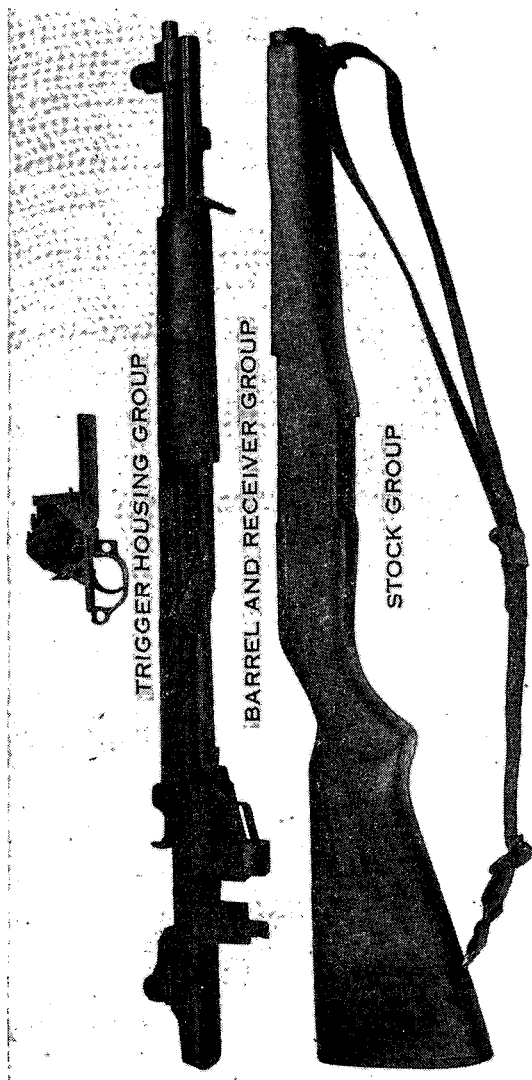


Figure 2. The three main groups.

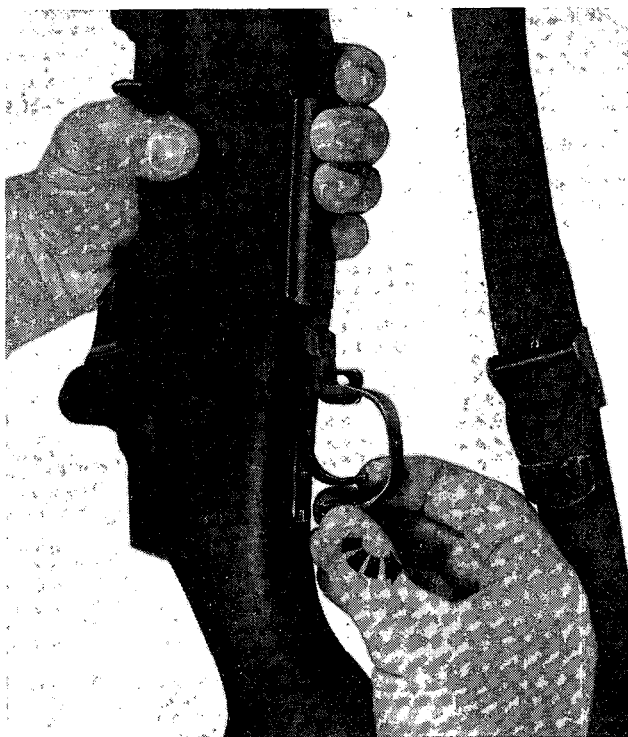


Figure 3. Removing the trigger housing group.

Chart I. Disassembly

Groups and parts	Individual soldier	Individual soldier when supervised by		Ordnance personnel only
		NCO or armorer artificer	Officer	
INTO THE THREE MAIN GROUPS-----	X			
BARREL AND RECEIVER GROUP-----	X			
Except:				
Bolt Assembly-----		X		
Gas Cylinder-----			X	
Gas Cylinder Lock-----		X		
Clip Latch-----		X		
Rear Sight-----			X	
Slide from Follower-----				X
Accelerator from Operating Rod Catch-----				X
Front Sight-----				X
TRIGGER HOUSING GROUP-----		X		
Except:				
Sear from Trigger-----				X

Note. The bolt assembly can be removed from the barrel and receiver group by the individual soldier. However, removal of the parts from the bolt assembly must be supervised by an NCO or armorer artificer.

6. Assembly of the Three Main Groups

a. Place the barrel and receiver group on a flat surface, sights down. Pick up the stock group and locate the **U**-shaped flange of the stock ferule. Engage this **U**-shaped flange in the lower band, then lower the stock group down onto the barrel and receiver group (fig. 4).

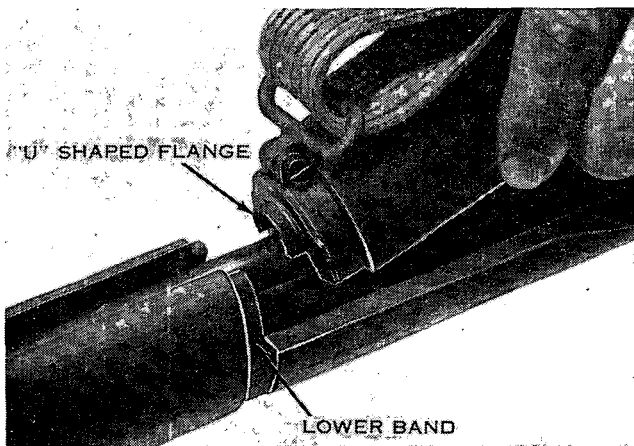


Figure 4. Replacing the stock on the barrel and receiver group.

b. Unlatch and open the trigger guard. Keeping the base of the trigger housing group level, place it straight down into the receiver, making sure that the locking lugs on the trigger guard enter the recesses in the receiver (fig. 5). Close and latch the trigger guard.

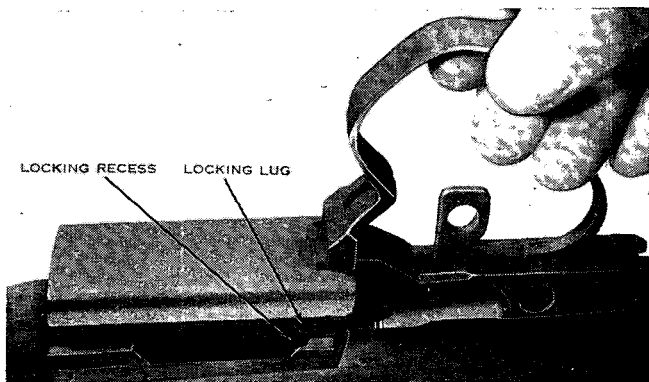


Figure 5. Replacing the trigger housing group.

7. Disassembly of the Barrel and Receiver Group

a. Place the barrel and receiver group, with the bolt closed, on a flat surface with the sights down, muzzle pointing to the left. With the thumb and forefinger of your left hand, grasp the follower rod and disengage it from the follower arm by moving it toward the muzzle (fig. 6). Remove the follower rod and operating rod spring by withdrawing them to the right. Do not separate these parts.

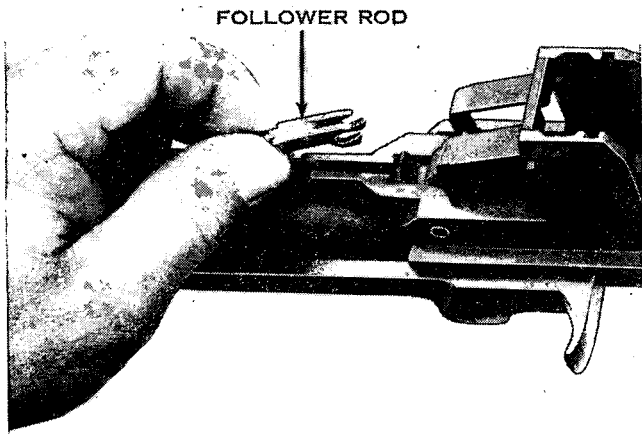


Figure 6. Removing the follower rod and operating rod spring.

b. Using the tip of a cartridge, push out the follower arm pin from the far side of the receiver toward your body (fig. 7).

c. Grasp the bullet guide, follower arm, and the operating rod catch assembly, and lift them out

of the receiver together (fig. 8). Separate and arrange these parts from left to right in the following order: follower arm, operating rod catch assembly, and bullet guide.

d. Reach down into the receiver and lift out the follower assembly.

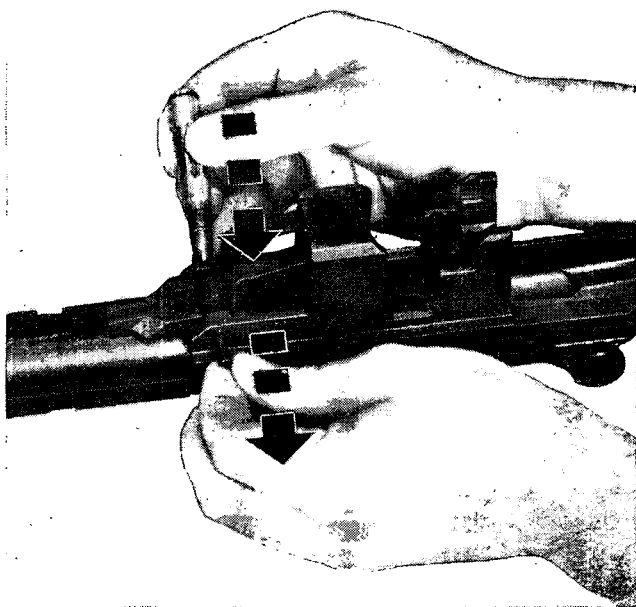


Figure 7. Removing the follower arm pin.

e. Turn the barrel and receiver group over so that the sights are up, muzzle pointing away from you. With your left hand, raise the rear of the group. With your right hand, pull the operating rod to the rear until the rear of the handle is directly under the forward edge of the windage

knob. Grasp the handle and, with an upward and outward pressure, disengage the guide lug of the operating rod through its dismount notch on the receiver. Remove the operating rod (fig. 9).

Note. The operating rod is bent intentionally so that it will not bind against the enlarged portion of the barrel. Do not attempt to straighten it.

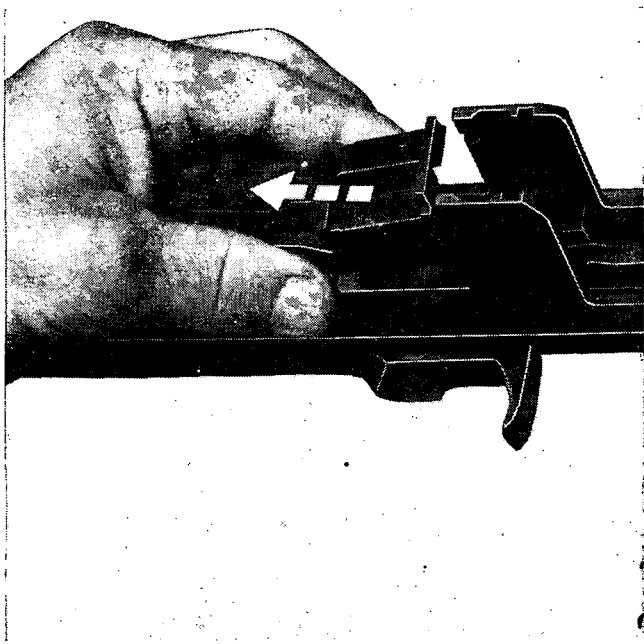


Figure 8. Removing the bullet guide, follower arm, and operating rod catch assembly.

f. Grasp the bolt by the operating lug and slide it fully to the rear; then slide it forward, lifting it upward and outward to the right front with a straight rotating motion to remove it.

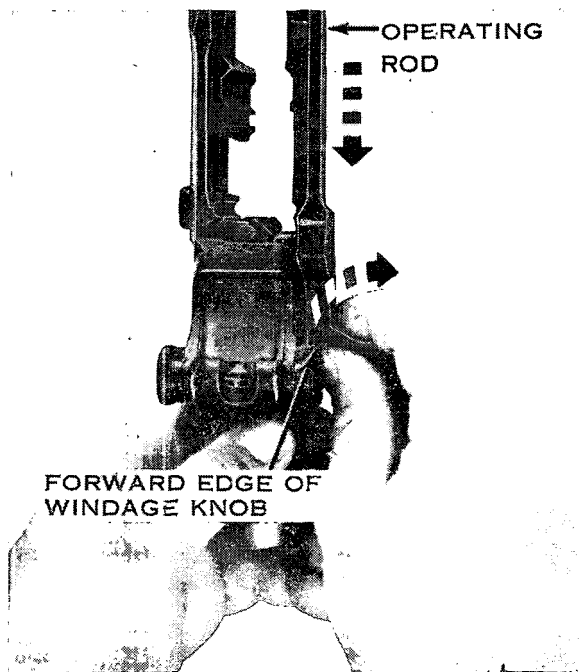


Figure 9. Removing the operating rod.

g. The parts of the barrel and receiver group in their order of disassembly are shown in figure 10.

8. Assembly of the Barrel and Receiver Group

a. The barrel and receiver group is assembled in the reverse order of disassembly. To replace the bolt, hold it by the operating lug and insert the rear end in its bearing on the bridge of the receiver. Rotate the bolt counterclockwise as far as necessary to permit the tang of the firing pin to clear the top of the bridge. Guide the left lock-

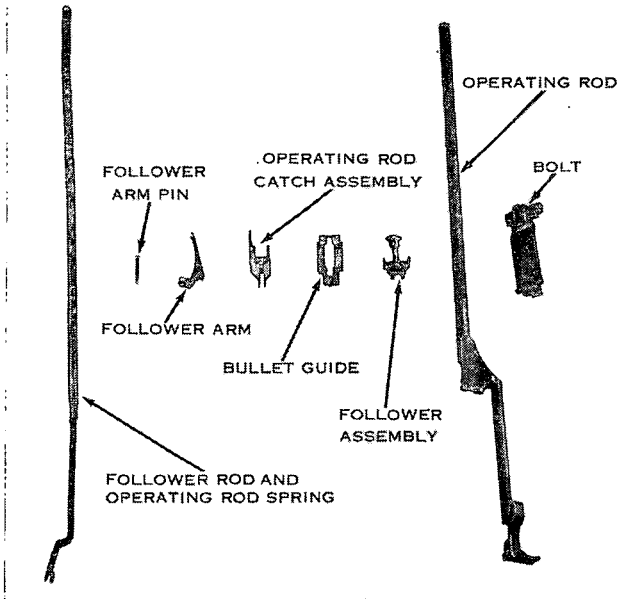


Figure 10. Parts of the barrel and receiver group in the order of disassembly.

ing lug of the bolt into its groove on the left side of the receiver. Lower the right locking lug on its bearing and slide the bolt halfway to the rear.

b. To replace the operating rod, hold it at the handle and place the piston into the gas cylinder. Adjust the operating rod so that the recess in the hump fits over the operating lug of the bolt. While applying pressure downward and inward on the handle, pull the operating rod to the rear until the guide lug is engaged in its groove (fig. 11). Move the operating rod forward until the bolt is closed.

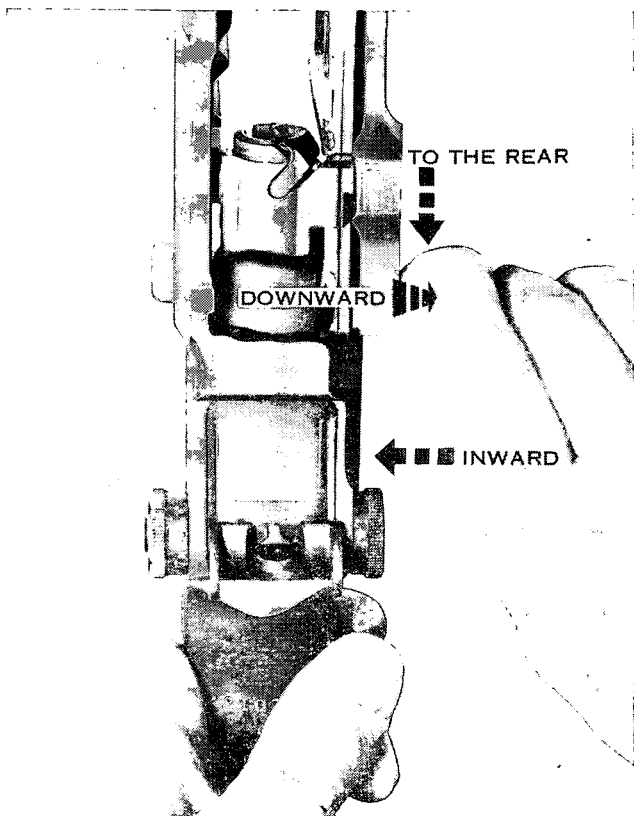


Figure 11. Replacing the operating rod.

c. Turn the barrel and receiver group over so that the sights are down and the muzzle is to the left. Replace the follower assembly so that its guide ribs fit into their grooves in the receiver. Make sure that the slide of the follower is down and that the square hole is to the rear (fig. 12). The slide will rest against the bolt.

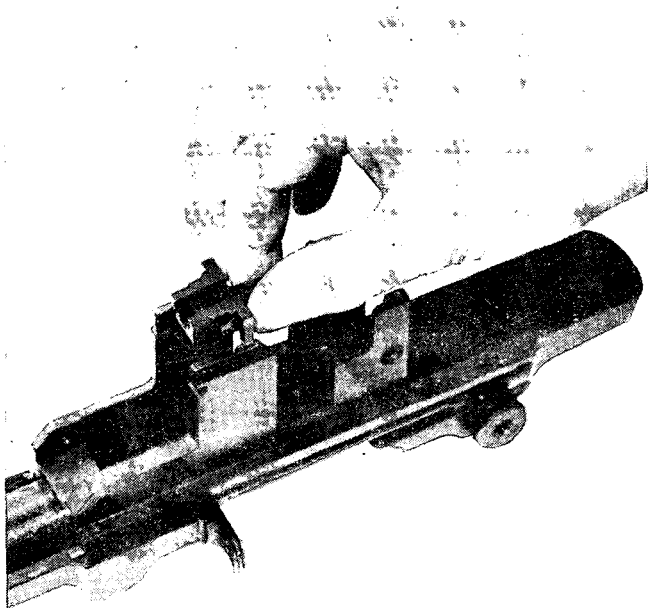


Figure 12. Replacing the follower assembly.

d. Replace the bullet guide so that its shoulders fit into their slots in the receiver and so that the hole in the toe of the bullet guide is lined up with the holes in the receiver (fig. 13).

e. With your right hand, lift up the lower part of the bullet guide slightly. With the left hand, insert the rear arm of the operating rod catch assembly through the clearance cut in the side of the bullet guide. Make sure that the rear arm is underneath the front stud of the clip latch which projects into the receiver (fig. 14). Lower the bullet guide into place. Test for correct assembly

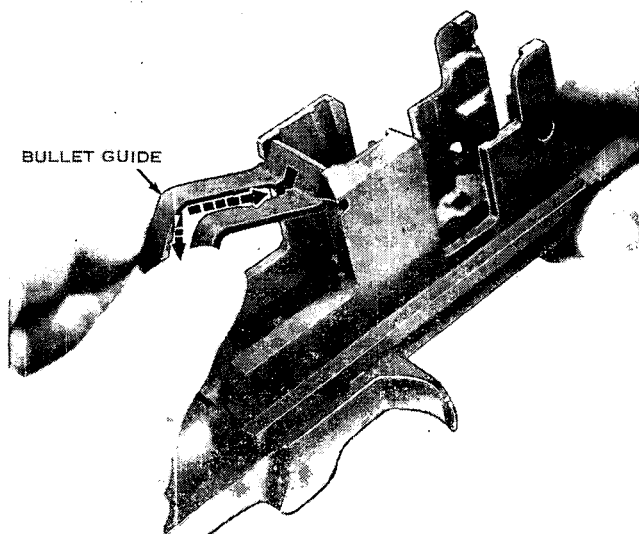


Figure 13. Replacing the bullet guide.

by pressing down on the front arms of the operating rod catch. It should move and you should be able to feel the tension of the clip latch spring.

f. Replace the follower arm by passing its rear studs through the bullet guide and inserting them into the guide grooves on the follower (fig. 15). Allow the wings of the follower arm to rest astride the toe of the bullet guide. Aline the holes in the operating rod catch, follower arm, and bullet guide with those in the receiver and replace the follower arm pin.

g. Insert the operating rod spring into the operating rod. Grasp the follower rod with the left hand, making sure that its hump is toward the barrel. Pull toward the muzzle, compressing the operating rod spring, and engage the claws of the

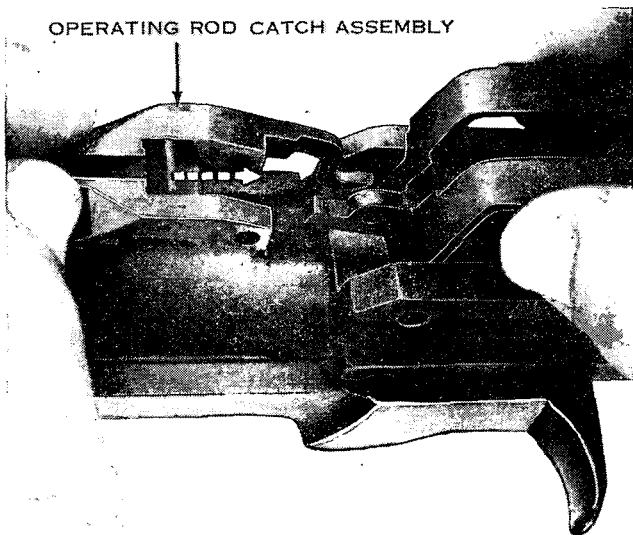


Figure 14. Replacing the operating rod catch assembly.

follower rod with the front studs of the follower arm (fig. 16). You may have to raise the follower assembly to do this. Check to see that the hump of the follower rod fits down between the front arms of the operating rod catch.

9. Removal and Replacement of the Gas Cylinder Lock Screw With Valve Assembly

a. Using the screwdriver blade of the M10 cleaning rod handle, unscrew and remove the gas cylinder lock screw with valve assembly (fig. 17). The rifleman is not allowed to remove the gas cylinder lock except when supervised.

b. Before replacing the gas cylinder lock screw, make sure that the gas cylinder lock is alined with the gas cylinder. Do not force the lock into aline-

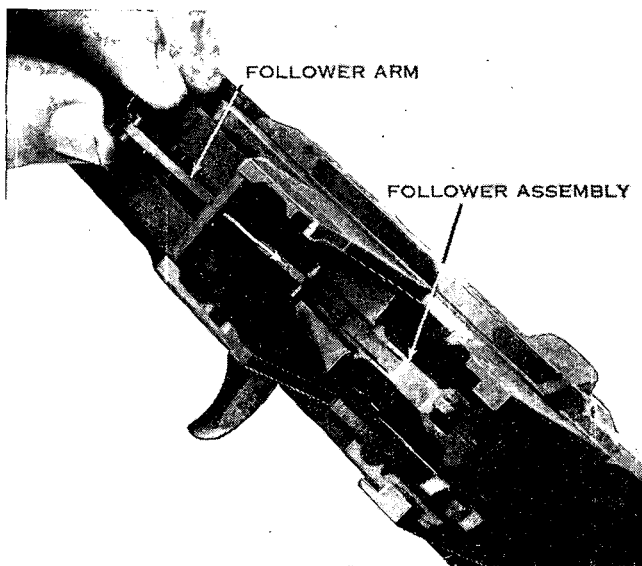


Figure 15. Replacing the follower arm.

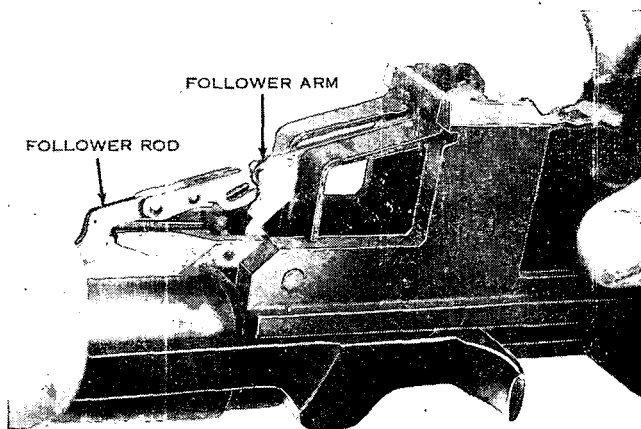


Figure 16. Replacing the follower rod and operating rod spring.

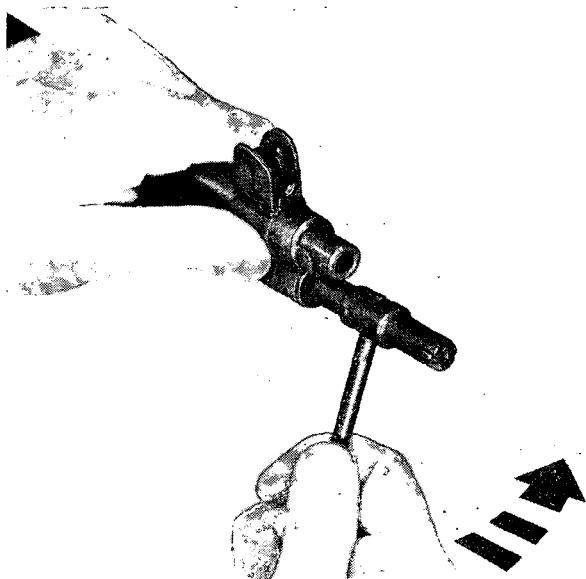


Figure 17. Removing the gas cylinder lock screw with valve assembly.

ment; unscrew it, if necessary, until it is alined. Replace the gas cylinder lock screw and tighten it with the screwdriver blade of the cleaning rod handle. This screw must be kept tight because if it is loose it will cause a vibration at the end of the barrel when the rifle is fired. This vibration may affect the accuracy of the rifle.

10. Test for Correct Assembly

Each time the rifle is disassembled and assembled it should be tested to make sure that it is put together properly. To do this, pull the operating rod to its rearmost position. The bolt should stay open. Close the bolt and snap the safety to its

locked position. Squeeze the trigger. The hammer should not fall. Push the safety to its unlocked position and squeeze the trigger. The hammer should fall.

Section II. DISASSEMBLY AND ASSEMBLY UNDER SUPERVISION

11. General

The parts of the rifle that individual soldiers are permitted to disassemble only under appropriate supervision are shown in the disassembly chart together with the level of supervision required. This supervision is needed to limit the number of times the parts are disassembled in order to keep wear to a minimum.

12. Disassembly of the Bolt

a. To disassemble the bolt, hold it in your left hand so that the operating lug is to the right. Place the little finger of the left hand under the tang of the firing pin. Insert the protruding blade at the hole end of the M10 cleaning rod handle between the bottom of the extractor and the lower cartridge seat flange. By applying pressure downwards on the cleaning rod handle to depress the ejector and at the same time twisting the handle clockwise (fig. 18), the extractor will unseat. Remove the cleaning rod handle slowly from its position on the face of the bolt for approximately $\frac{3}{8}$ of an inch. This will relieve the tension on the ejector spring so as to prevent the ejector and spring from snapping out of its recess in the bolt when the cleaning rod handle is removed completely.

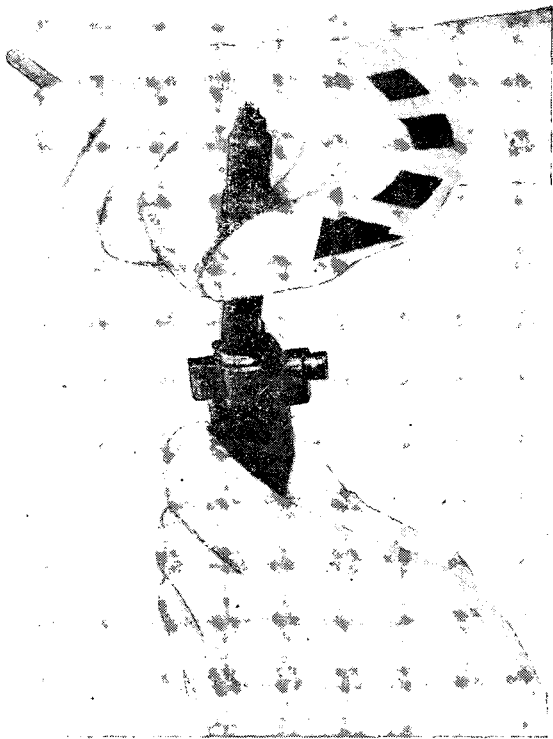


Figure 18. Unseating the extractor.

b. Remove the extractor and extractor spring and plunger. Lift out the ejector and ejector spring. Do not separate the ejector from its spring nor the extractor plunger from its spring. Remove the firing pin from the rear of the bolt. Figure 19 shows the parts of the bolt laid out in the order of assembly.

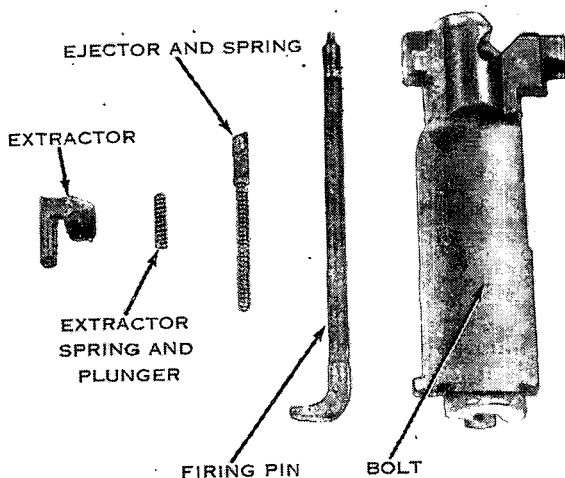


Figure 19. Parts of the bolt in the order of disassembly.

13. Assembly of the Bolt

a. To assemble the bolt, insert the firing pin, making sure that the tang fits into its recess on the rear of the bolt. Hold the bolt in your left hand with the face up, the operating lug to the right, and with the rear end on a solid surface. Replace the ejector and the ejector spring so that the cut on the ejector is toward the operating lug. Replace the extractor spring and plunger. Place the stud of the extractor into its hold in the bolt and press lightly on the extractor with the left thumb until it begins to ride over the extractor plunger. Place the bolt disassembling and assembling end of the M10 cleaning rod handle so that the cutout portion will fit over the ejector and the

blade is positioned to line up between the bottom of the extractor and the lower cartridge seat flange (fig. 20). Press downward on the cleaning rod handle until the ejector is forced into the face of the bolt, and at the same time, press inward on the extractor with your left thumb, seating it.

b. The tip of a cartridge may be used instead of the M10 cleaning rod handle to force the ejector into the face of the bolt and seat the extractor.

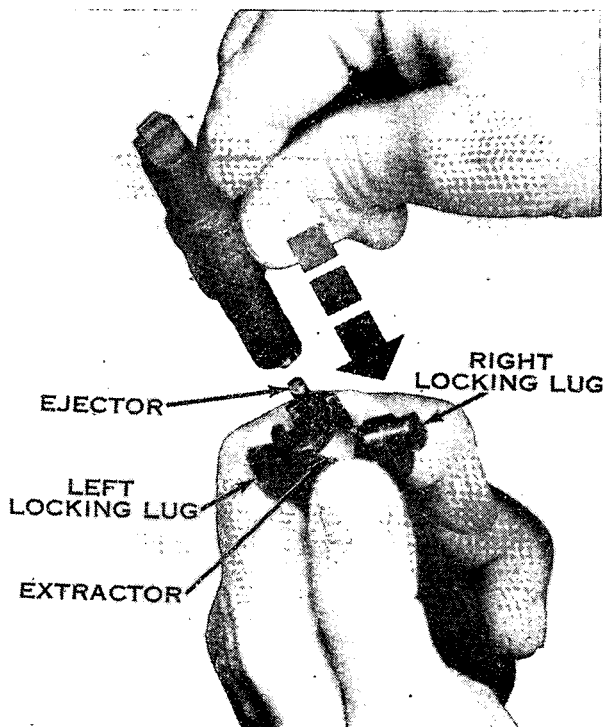


Figure 20. Assembling the bolt.

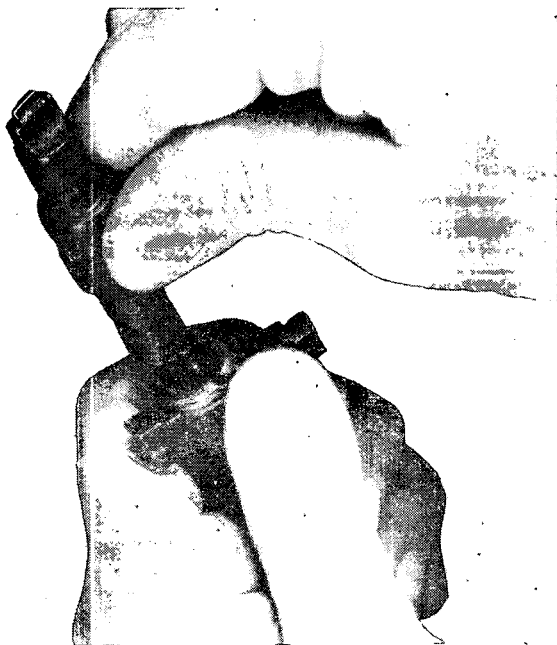


Figure 20—Continued.

14. Disassembly and Assembly of the Bolt With the Bolt in the Rifle

a. The bolt may be disassembled without removing it from the rifle to replace a broken extractor, ejector, or firing pin. Pull the bolt to the rear and insert the screwdriver blade of the M10 cleaning rod handle into the chamber. Allow the bolt to close slowly. The protruding blade of the cleaning rod handle must be to the right so that it will fit under the extractor. Force the operating rod forward to compress the ejector spring and rotate the cleaning rod handle, unseat-

ing the extractor (fig. 21). Slowly move the bolt to the rear, allowing the ejector spring to expand. The extractor and ejector can then be removed. (If it is necessary to remove the firing pin, the barrel and receiver group must be separated from the stock group. Then, after the extractor and ejector have been removed, the firing pin will fall out to the rear if the barrel is tilted up.)

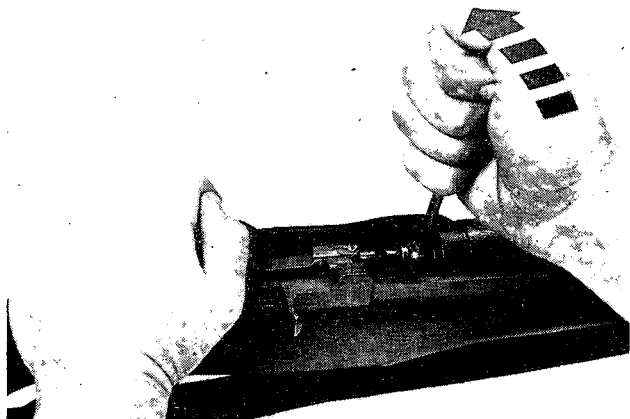


Figure 21. Disassembling the bolt without removing it from the rifle.

b. To assemble the bolt while it is in the rifle, replace the parts as described in paragraph 13. Place the screwdriver blade end of the M10 cleaning rod into the chamber in the same manner used for disassembling the bolt. Push the operating rod forward, compressing the ejector spring, and push the extractor down until it is seated.

15. Removal and Replacement of the Gas Cylinder Lock and Gas Cylinder

a. Remove the gas cylinder lock screw as described in paragraph 9. Unscrew and remove the gas cylinder lock. Loosen the gas cylinder by tapping lightly toward the muzzle on the bayonet stud with a piece of wood or similar soft object (fig. 22). Remove the gas cylinder, taking care not to bur or damage the splines. Do not

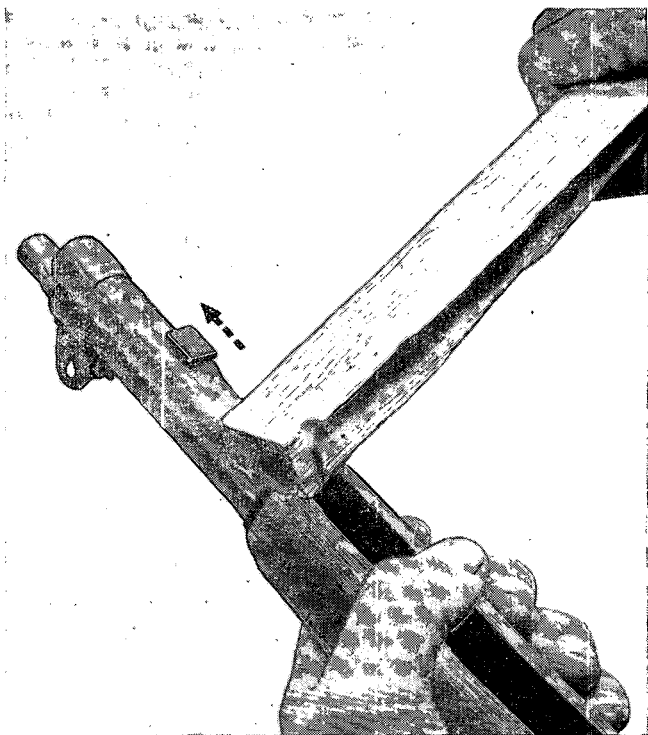


Figure 22. Removing the gas cylinder.

remove or make any attempt to adjust the front sight.

b. To replace these parts, first place the gas cylinder over the barrel, making sure the splines are alined with their grooves. Push it down as far as it will go. If tapping is necessary, use a piece of wood on the bayonet stud. Engage the threads of the gas cylinder lock with those on the barrel and screw the lock on by hand until it is finger tight (do not use a tool). If the lock is not alined with the gas cylinder, do not force it, but unscrew it until it is alined. Replace and tighten the gas cylinder lock screw.

16. Disassembly of the Clip Latch

Place the rifle on its right side with the muzzle pointing to the left. With the thumb of your left hand, depress the clip latch. Using the tip of a cartridge, push forward on the clip latch pin and unseat it (fig. 23). Remove it by withdrawing

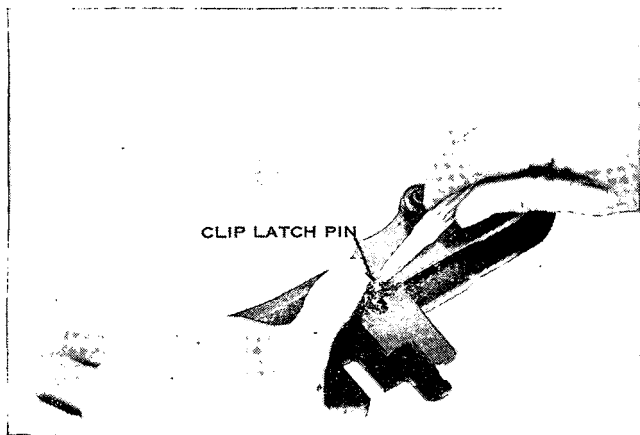


Figure 23. Removing the clip latch.

it with your fingers. Lift out the clip latch with the clip latch spring attached.

17. Assembly of the Clip Latch

Place the clip latch with the clip latch spring attached in position on the left side of the receiver and start replacing the clip latch pin from the front. Press in on the thumb piece of the clip latch and push the clip latch pin all the way in.

18. Disassembly of the Trigger Housing Group

a. To disassemble the trigger housing group, close and latch the trigger guard. Squeeze the trigger, allowing the hammer to go forward. Hold the trigger housing group in your left hand with the vertical face to the left and the open face down. Using the tip of a cartridge, apply pressure on the trigger pin until its head is unseated (fig. 24). Next, hold the trigger housing group as shown in figure 25. Apply a pinching pressure

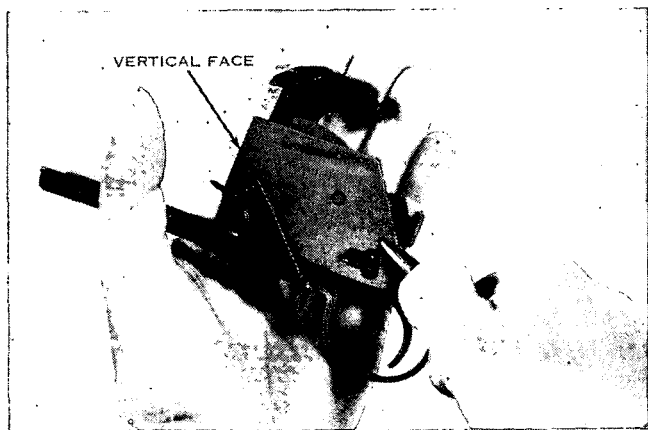


Figure 24. Unseating the trigger pin.

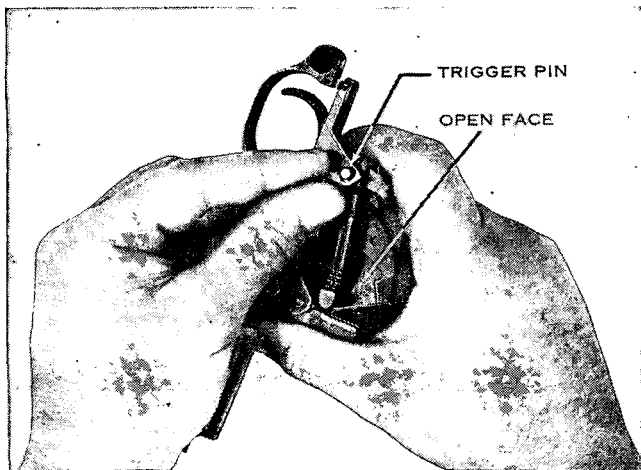


Figure 25. Removing the trigger pin.

with the thumb and index finger and remove the trigger pin. Slowly release the pressure, allowing the hammer spring to expand.

b. Hold the trigger housing group in your left hand with the vertical face toward your body and the open face up. Remove the trigger assembly, hammer spring housing, hammer spring, and hammer spring plunger.

c. Hold the trigger housing group in your left hand with the vertical face away from your body and the open face down. Using the tip of a cartridge, push out the hammer pin (fig. 26). Move the hammer slightly to the rear and lift it out.

d. Unlatch and open the trigger guard. Push the top of the safety toward the open face to unseat the stud of the safety from its hole. Re-



Figure 26. Removing the hammer pin.

move the safety by lifting it from its slot in the base of the trigger housing (fig. 27).

e. Hold the trigger housing in your left hand with the vertical face away from your body. Grasp the trigger guard with your right hand and slide it to the rear until its wings are aligned with the safety stud hole. Rotate the trigger guard upward until the hammer stop inside the

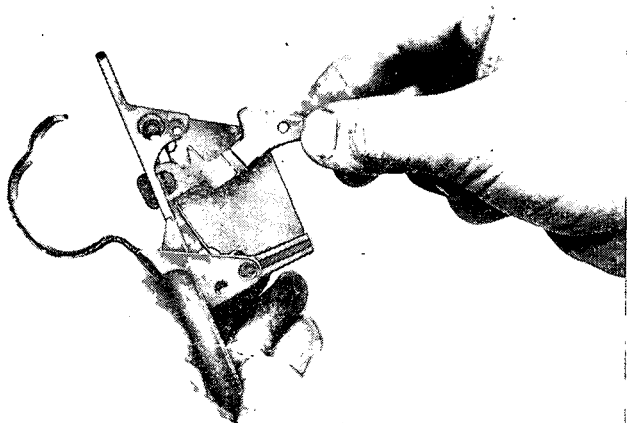


Figure 27. Removing the safety.

right wing clears the base of the trigger housing. Remove the trigger guard to the right (fig. 28).

f. Hold the trigger housing in your left hand with the vertical face to the left and the rear of the housing resting on a solid surface. Using the tip of a cartridge, apply pressure on the clip ejector through its dismount hole and unseat it from its stud (fig. 29).

19. Assembly of the Trigger Housing Group

a. Hold the trigger housing in your right hand, with the vertical face to the left and the open face up. Place the clip ejector in position in the

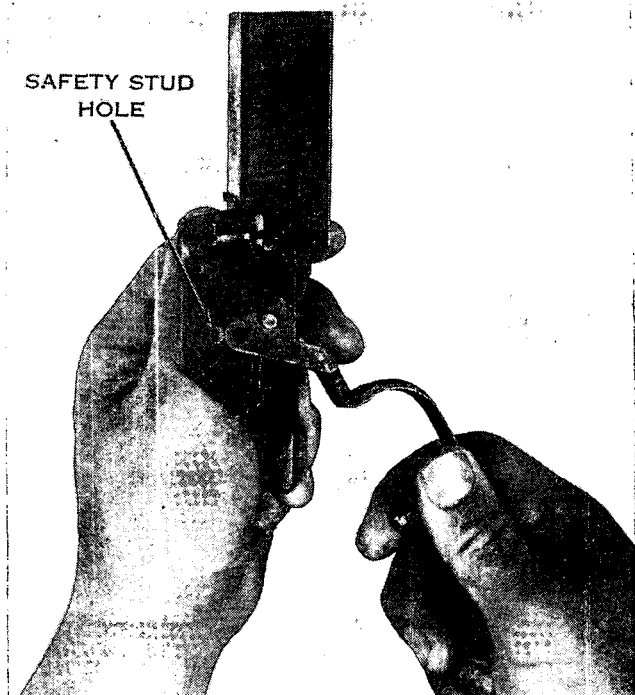


Figure 28. Removing the trigger guard.

trigger housing with the short arm toward your body and the tip of the long arm in its slot in the vertical face of the trigger housing. Position the loop of the clip ejector on top of its stud and hold it there with your right thumb. With the forefinger of your left hand, hold the long arm up in its slot on the vertical face. Place the tip of your left thumb between the long arm and the base of the trigger housing and move the long arm toward your body, exerting a downward pressure.

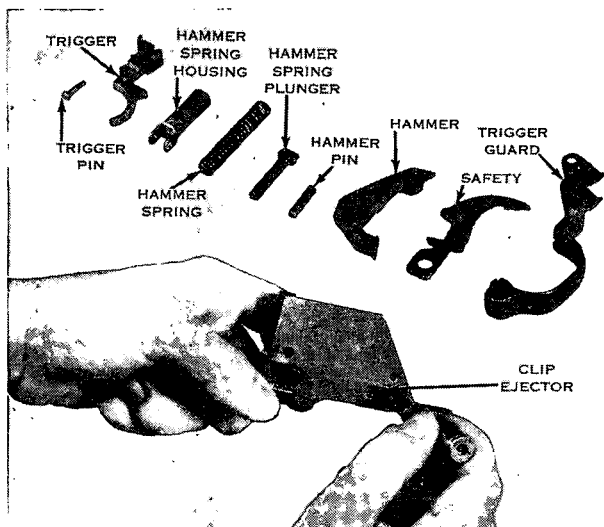


Figure 29. Removing the clip ejector. (Other parts of the trigger housing group are shown in the order of disassembly.)

The clip ejector will snap into position with the loop seated on its stud and the long arm in its slot on the vertical face (fig. 30).

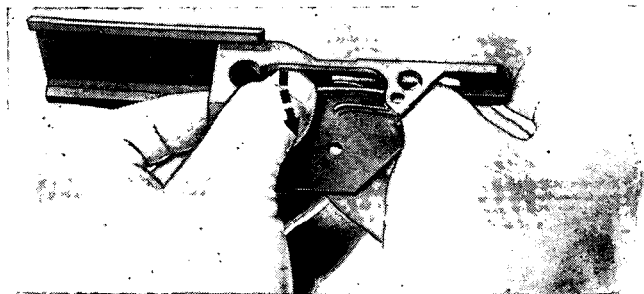


Figure 30. Replacing the clip ejector.

b. Hold the trigger housing in your left hand with the vertical face away from you. Place the wings of the trigger guard astride the base of the trigger housing at the same point from which the trigger guard was removed. Swing the trigger guard down and to the left, then slide it forward into position.

c. Insert the finger piece of the safety through its slot in the base of the trigger housing. Seat the safety stud in its hole by forcing the safety down against the pressure of the short arm of the clip ejector and, at the same time, applying pressure to the left. Push the finger piece of the safety forward.

d. Hold the trigger housing in your left hand, the vertical face away from you and the open face up. Place the hammer in position, holding it halfway between the cocked and fired positions. Be sure that the hammer toe is in front of the hammer stop on the right wing of the trigger guard. Aline the hammer pin hole in the hammer with the holes in the trigger housing and trigger guard. The trigger guard should not be latched. Replace the hammer pin from the top and seat it.

e. Assemble the hammer spring plunger, hammer spring, and hammer spring housing into one unit. Hold the trigger housing in your left hand with the vertical face toward your body and the open face up. Place the plunger in its seat on the hammer. Make sure that the cutaway portion of the hammer spring housing is toward the safety. Hold these parts in place with your left

thumb and insert the trigger into the trigger slot so that the notch at the curved rear surface of the finger piece bears against the rear of the slot in the trigger housing. Place the wings of the hammer spring housing astride the sear pin. With your right forefinger hooked over the sear and the right thumb on the vertical face, apply pressure to compress the hammer spring and aline the holes for the trigger pin. Insert the trigger pin as far as its head (fig. 31).

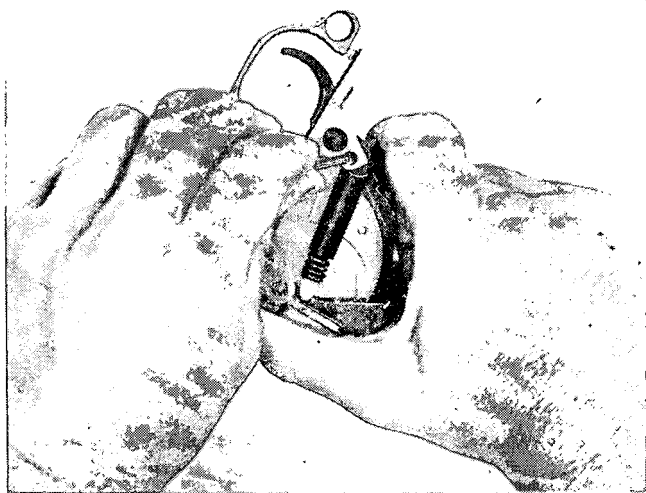


Figure 31. Replacing the trigger pin.

f. Holding the trigger housing in the same manner, apply pressure in the directions shown in figure 32 and seat the head of the trigger pin by pressing on it with the left thumb.

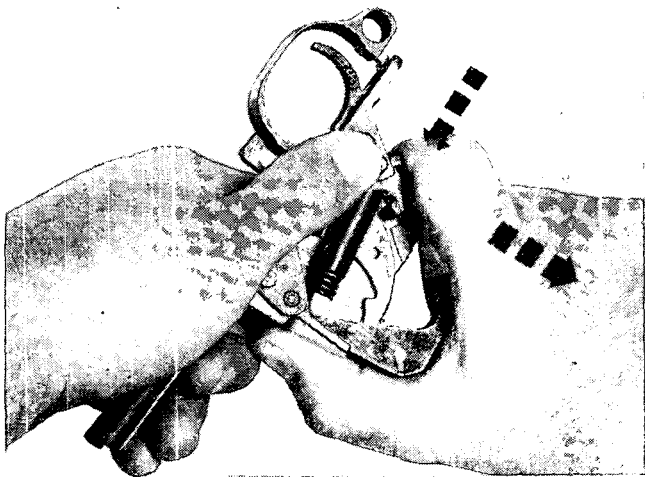


Figure 32. Seating the trigger pin.

20. Disassembly of the Rear Sight

a. The parts of the rear sight are shown in figure 33. To disassemble the sight, first lower the aperture as far as it will go. If the sight has been calibrated (par. 97), record the reading on the elevating knob. You will need this reading when you replace the elevating knob assembly.

b. Using the screwdriver blade of the M10 cleaning rod handle, unscrew the nut in the center of the windage knob. It will become loosened, but it cannot be removed. Unscrew the windage knob counterclockwise until the windage knob assembly can be removed. Remove the elevating knob assembly by withdrawing it to the left. Pull the aperture up about one-half inch and place your right thumb underneath it, then push forward and upward, removing the aperture, cover, and base.

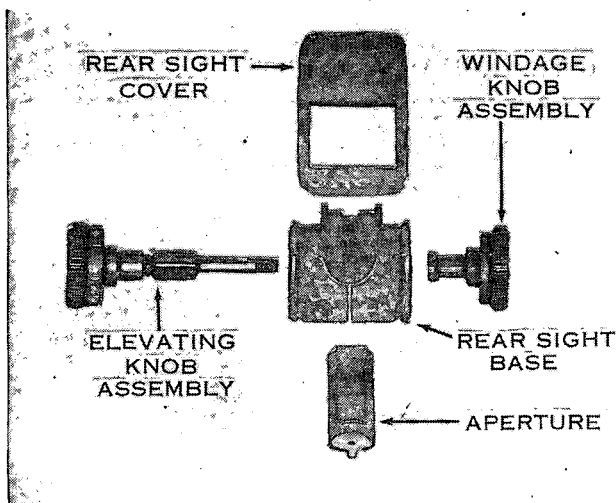


Figure 33. Parts of the rear sight.

c. Some rifles may still have the old type rear sight, which can be identified by the locking nut on the windage knob. This type sight should be disassembled only when absolutely necessary because the end of the elevating pinion is spread to prevent the locking nut from coming off. The threads on the end of the pinion will become damaged each time the locking nut is removed. The parts of this sight are shown in figure 34.

d. To disassemble the old type rear sight, run the aperture all the way down and record the reading on the elevating knob. Unscrew and remove the elevating knob screw and then the elevating knob. Remove the locking nut with a pair of pliers. Unscrew and remove the windage knob, being careful not to lose the nut lock and spring which are inside. Remove the elevating

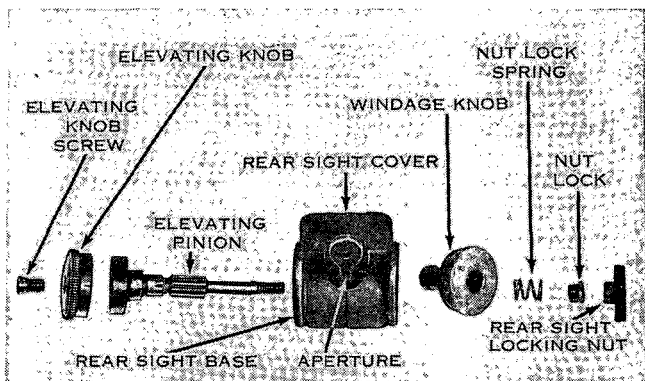


Figure 34. Parts of the old type rear sight.

pinion by withdrawing it to the left. The aperture, cover, and base are removed as described for the other type sight.

21. Assembly of the Rear Sight

a. Assemble the rear sight cover and base into one unit. Place the rear lip of the sight cover in its slot at the rear end of the sight bracket. Press down against the front part of the sight cover, seating it in its slot in the front end of the sight bracket. Insert the aperture in its slot in the base and slide it to its lowest position. Replace the windage knob assembly and screw it in until it draws the base to the center position on the windage gage. Insert the elevating knob assembly from the left, meshing the pinion with the teeth on the aperture. Make sure that the reading recorded before disassembly is opposite the index mark on the receiver. Turn the assembly slightly and push until it is all the way in. Using the screwdriver blade of the M10 cleaning

rod handle, tighten the nut in the center of the windage knob. When it is tight, back it off one complete turn. This should give the correct tension.

- (1) Obtaining the proper tension is extremely important because this sight does not have the locking nut. Without proper tension, the sight will not hold its adjustment in elevation. If you cannot hear clear, sharp clicks when you turn the elevating knob, or if the aperture drops when the rifle is fired, check the tension as follows:

- (a) Run the aperture up 15 to 20 clicks.
- (b) Press down on the top of the aperture with the thumb (fig. 35).

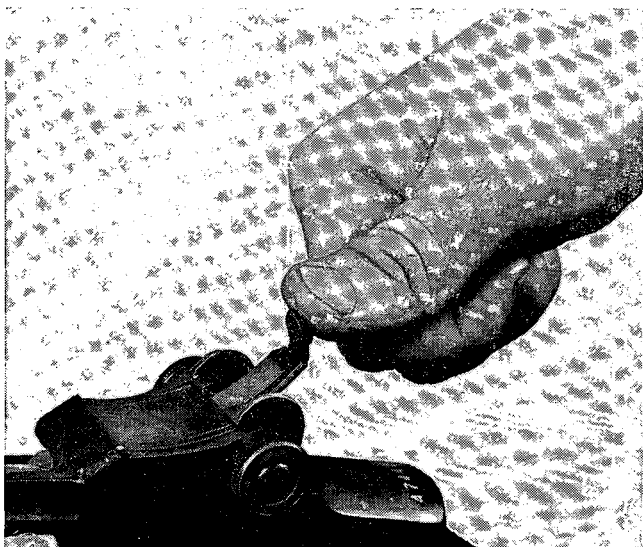


Figure 35. Checking for proper sight tension.

- (c) If the aperture drops, the tension must be adjusted.
- (2) To adjust the tension, first make sure that the screw in the center of the elevating knob is tight. Next, tighten the nut in the center of the windage knob one click at a time. Test the tension as described in (1) (a), (b), and (c) above after each click and continue the process until the aperture does not drop. If the proper tension cannot be set by doing this, the rear sight must be repaired.
- (3) When sight tension is properly applied, the windage knob may be hard to turn. This may be overcome by pressing inward on the screw in the center of the elevating knob assembly with the left thumb while turning the windage knob with the right hand.

b. To assemble the old type rear sight, replace the base, cover, and aperture as described for the other sight. Hold the base forward against the cover and insert the elevating pinion into the left side. Insert the windage knob into the base and move the base to the left until the index mark is at the left edge of the windage scale. Screw the windage knob until the index mark is opposite the center line on the scale. Place the nut lock and nut lock spring in position in the windage knob around the threaded end of the elevating pinion, making sure that the flat cut on the nut lock is aligned with the flat portion of the elevating pinion. Screw the nut lock onto the elevating pin-

ion until the desired tension is obtained. Make sure it is not too tight; otherwise, the windage and elevating knobs will become locked and cannot be turned. Lower the aperture as far as it will go by turning the elevating pinion. Replace the elevating knob and turn it to the reading that was noted before the sight was disassembled. Holding it in this position, replace the elevating knob screw. Tighten the screw after running the aperture to its highest position. Replace the locking nut on the pinion. If you can remove the locking nut without using pliers or a small wrench, the end of the pinion should be respread, using the punch that is provided for this purpose. The company armorer artificer is authorized to do this.

Section III. OPERATION, STOPPAGES, AND IMMEDIATE ACTION

22. Loading the Rifle

a. Single Round. To load a single round, pull the operating rod all the way to the rear. While holding the muzzle below the horizontal, place a round in the chamber and seat it with the thumb. With the palm of the right hand against the right side of the receiver and the rear edge of the right hand against the operating rod handle, force the operating rod slightly to the rear. Push down on the follower with the right thumb and allow the bolt to ride forward over the follower. Remove the thumb from the follower and release the operating rod handle, allowing the operating rod to go all the way forward.

b. Full Clip. To load a full clip, hold the rifle at the balance with the left hand and pull the

operating rod handle all the way to the rear. Place the butt of the rifle against the thigh or on the ground. With the right hand, place a full clip on top of the follower. Close the right hand into a fist with the thumb extended. Place the thumb on the center of the top round in the clip and pointing to the left. With the elbow held high, press the clip straight down into the receiver until it catches (fig. 36). Swing the right hand up and to the right to clear the bolt in its forward movement. Note that the operating rod is not held to the rear during loading since there is no danger of it going forward as long as pressure is maintained on the top round in the clip. You may strike forward on the operating rod handle with the heel of the right hand when necessary to fully close and lock the bolt.

c. Partially Filled Clip. To load a partially filled clip, hold the rifle in the same manner prescribed for a full clip. With the operating rod all

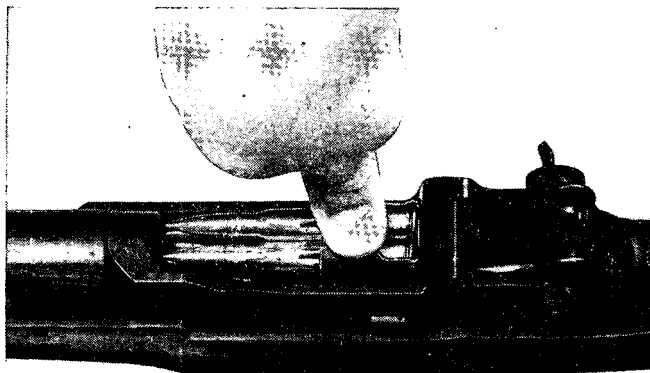


Figure 36. Loading a full clip.

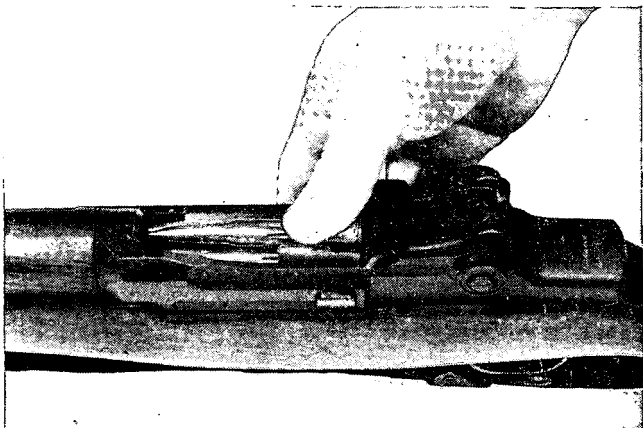


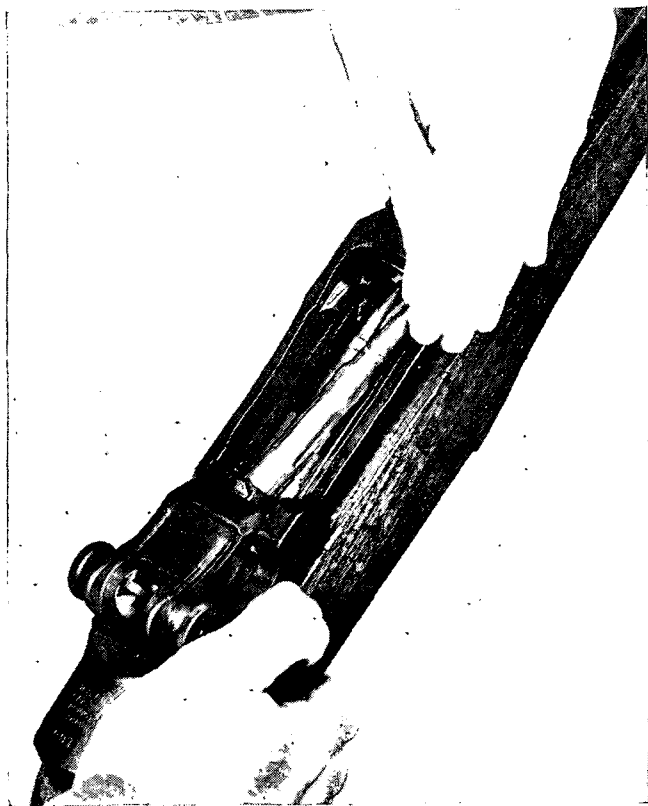
Figure 37. Loading a partially filled clip.

the way to the rear, place an empty clip into the receiver. Place the first round into the clip and on the follower to the left of the follower slide. Press the second round into the clip, exerting a downward, turning motion until the round snaps into place. Load the remaining rounds in the same manner (fig. 37). With the palm of the right hand against the right side of the receiver and the rear edge of the right hand against the operating rod handle, force the operating rod slightly to the rear. Push down on the top round with the right thumb, allowing the bolt to move forward and start the top round forward. Remove the right hand and allow the operating rod to go forward.

23. Unloading the Rifle

a. To unload a round from the chamber, support the rifle butt on the thigh or on the ground,

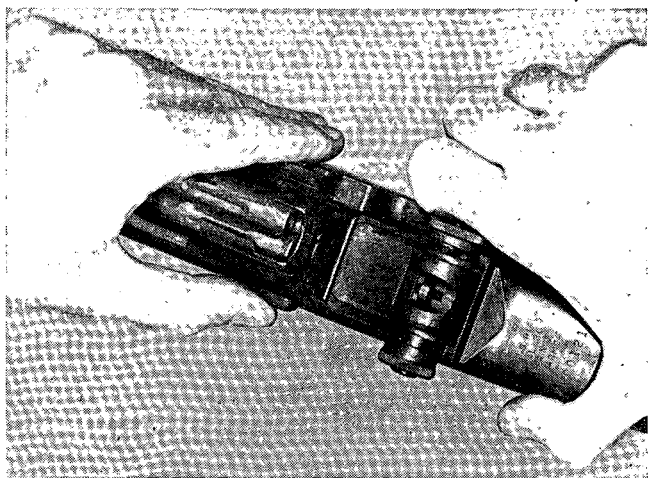
hook the right thumb or forefinger over the operating rod handle and pull the operating rod slowly to the rear. At the same time, place the left hand, palm down, over the receiver to catch the round as it is ejected (fig. 38 ①). This keeps the round from falling into the dirt or away from your position.



① Unloading a round from the chamber

Figure 38.

b. To unload a filled or partially filled clip, unload the round that is in the chamber as described in *a* above. When the operating rod reaches its rearmost position, hold it there by grasping the trigger guard with the fingers of the right hand or by hooking the right thumb around the rear of the receiver. Place the palm of the left hand over the receiver and depress the clip latch with the left thumb, allowing the clip to be ejected up into the hand (fig. 38 ②). Do not relax the rearward pressure on the operating rod handle until after you depress the clip latch.



② Unloading a filled or partially filled clip

Figure 38—Continued.

24. Loading Rounds Into a Clip

a. Insert eight rounds into the clip, holding the clip and rounds in the manner shown in figure 39. Start placing the rounds in from the lower left of the clip and make sure that each round is against

the rear wall so that the inner rib of the clip engages the extracting groove of each round. The top round will then be on the right, making the clip easier for a right-handed firer to load in the rifle. Clips are loaded this way at the arsenal for the same reason.

b. Each time rounds are loaded into a clip, the clip should be checked for long rounds. If one round extends beyond the others, it will be hard

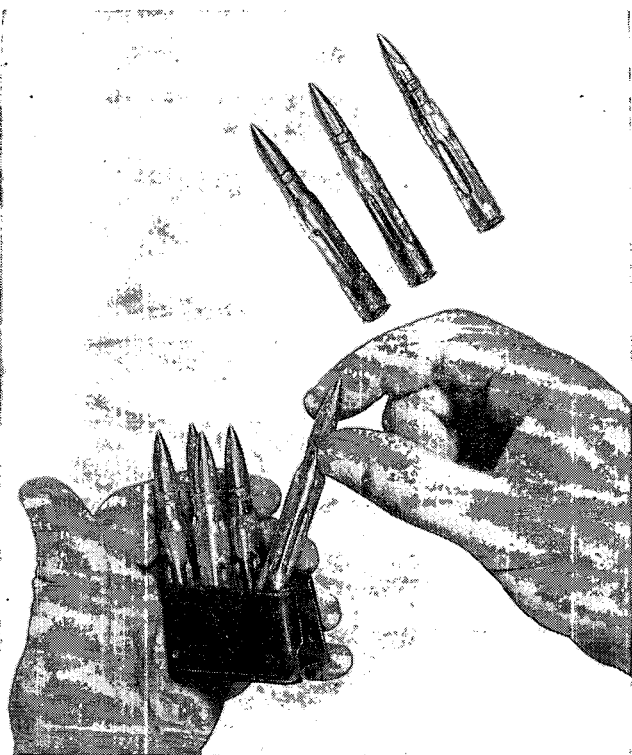


Figure 39. Loading rounds into a clip.

to load the clip in the rifle. The long round should be seated by removing the top round, pushing the long round into place, and then replacing the top round. Tapping the bullet against a solid surface to seat the long round may result in the bullet being pushed back into its cartridge case. This may damage the bullet or break the bullet seal which could result in changes in the ballistic performance of the round.

25. Firing and Clearing the Rifle

a. The trigger must be squeezed to fire each round. When the last round has been fired, the empty clip is automatically ejected and the bolt remains to the rear.

b. The rifle is cleared by pulling the operating rod all the way to the rear, inspecting the chamber and receiver, and pushing the safety to its locked position (inside the trigger guard). If the rifle is loaded, unload it as described in paragraph 23 before clearing it.

26. Functioning of the Rifle

a. Each time a round is loaded and fired, many parts inside the rifle work in a given order. This is known as the *cycle of operation*. This cycle is similar in all small arms. A knowledge of what happens inside the rifle during this cycle of operation will help the soldier understand the cause and remedy for various stoppages.

b. The cycle of operation is broken down into eight steps. These steps are listed below, together with a brief description of what actually occurs inside the rifle during each step. Assume

that a full or partially filled clip has been loaded in the rifle and that the first round has been fired and the bolt is in its rearmost position (fig. 40).

- (1) *Feeding.* Feeding takes place when a round is moved into the path of the bolt. This is done by the follower exerting an upward pressure on the bottom round in the clip. The follower is continuously forced up by the pressure of the operating rod spring through the follower rod and follower arm (fig. 40).
- (2) *Chambering.* Chambering occurs when a round is moved into the chamber. This takes place as the bolt goes forward. It picks up the top round in the clip and drives it forward into the chamber (fig. 41). Chambering is complete when the extractor snaps into the extracting groove on the cartridge case and the ejector is forced into the face of the bolt.
- (3) *Locking.* Locking occurs when the bolt is closed tight. This prevents the loss of gas pressure until the bullet has left the muzzle. The bolt is locked by the rear camming surface in the recess in the hump of the operating rod forcing the operating lug of the bolt down. This engages the locking lugs on the bolt with their recesses in the receiver (fig. 42).
- (4) *Firing.* Firing occurs when the firing pin strikes the primer of the cartridge. When the trigger is squeezed, the trigger lugs

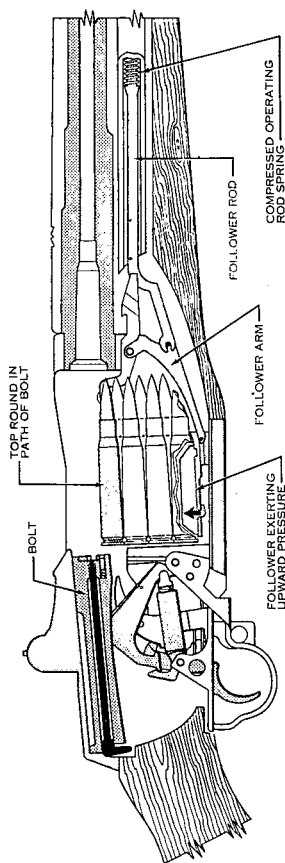


Figure 40. Position of parts when the bolt is in its rearmost position.

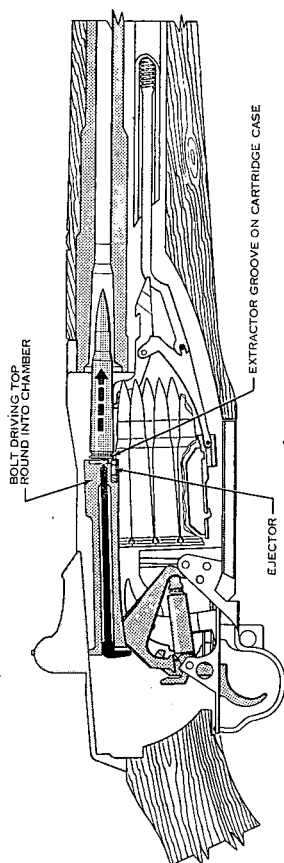


Figure 41. 'Chambering.

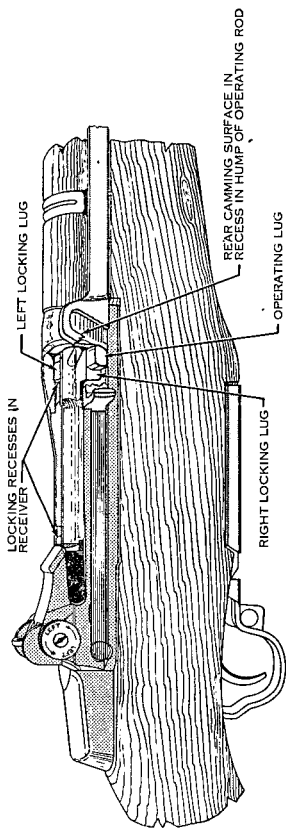


Figure 42. Locking.

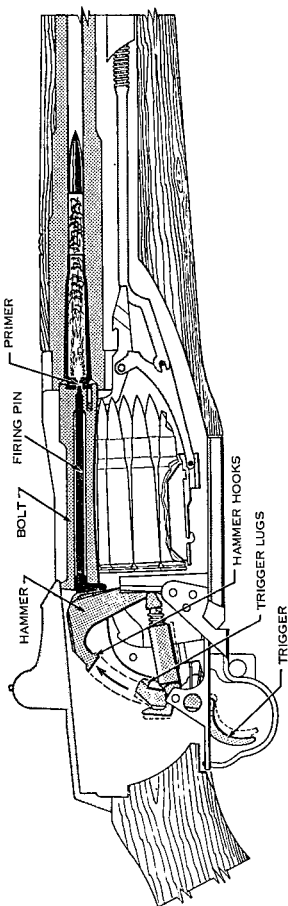


Figure 43. Firing.

are disengaged from the hammer hooks and the hammer is released. The hammer moves forward and strikes the tang of the firing pin, driving the firing pin against the primer on the cartridge, activating it and firing the round (fig. 43).

- (5) *Unlocking.* Unlocking occurs after the firing of the round. As the bullet is forced through the barrel by the expanding powder gas, a small portion of the gas escapes through the gas port into the gas cylinder, forcing the operating rod to the rear (fig. 44). The camming surface inside the recess in the hump of the operating rod forces the operating lug of the bolt upward, disengaging the locking lugs from their recesses in the receiver. The bolt is thus unlocked and ready to be moved to the rear (fig. 45).

- (6) *Extracting.* Extracting is pulling the empty cartridge case from the chamber.

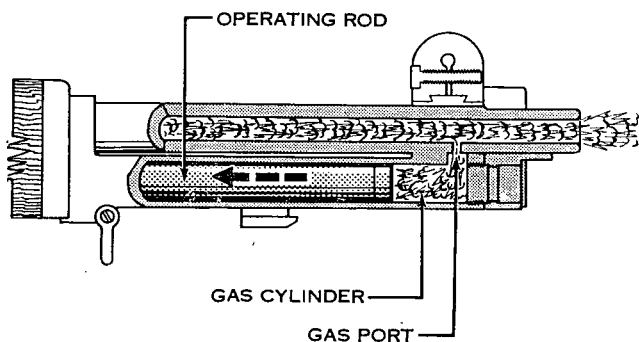


Figure 44. Action of the gas.

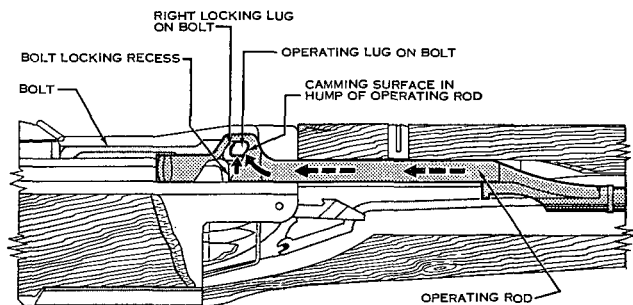


Figure 45. *Unlocking.*

The extractor, which is engaged with the extracting groove on the cartridge case, withdraws the empty case as the bolt moves to the rear (fig. 46).

- (7) *Ejecting.* Ejecting is throwing the empty case from the rifle. As the bolt moves to the rear, withdrawing the case from the chamber, the round is held in place by the chamber walls. When the mouth of the empty case clears the chamber, it is ejected up and to the right front by the expanding ejector spring and ejector.
- (8) *Cocking.* Cocking occurs when the hammer is forced into the proper position for firing the next round. This happens as the bolt continues to the rear. The rear end of the bolt forces the hammer back and rides over it. The hammer is caught by the sear if the trigger is still held to the rear, but by the trigger lugs if the trigger pressure has been released (fig. 47).

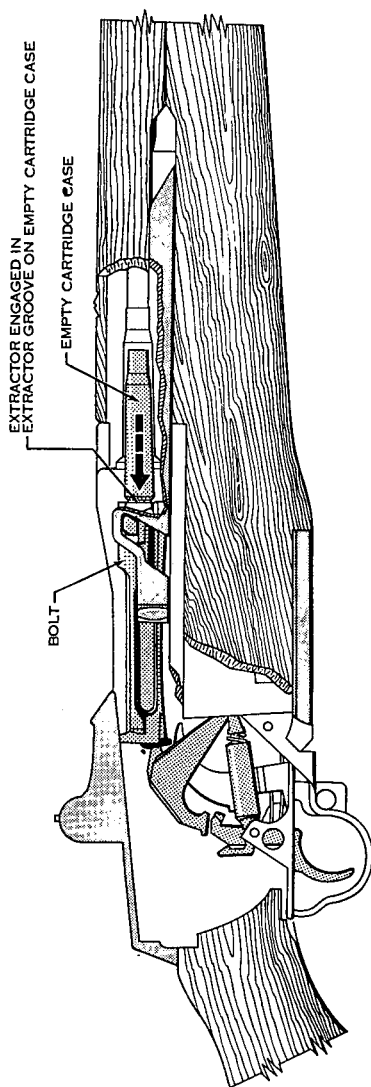


Figure 46. Extracting.

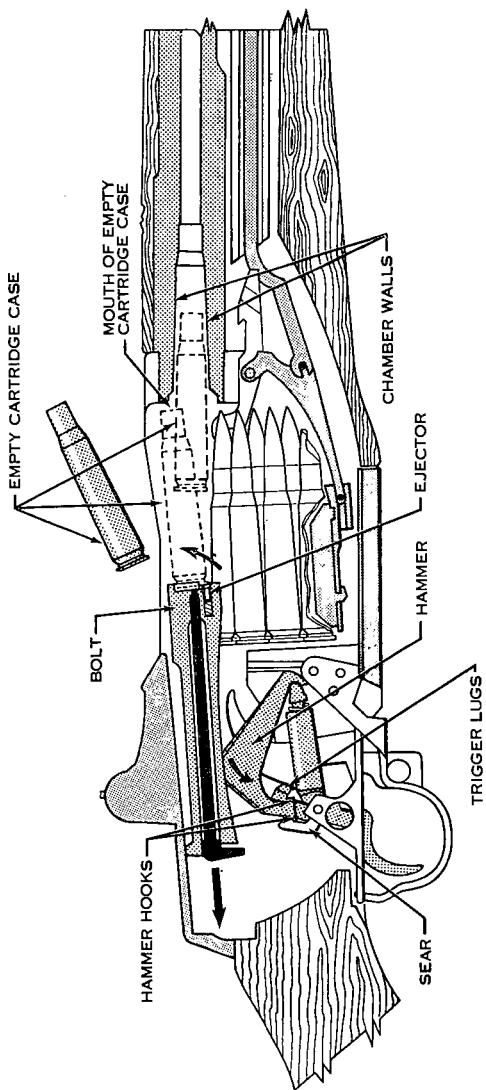


Figure 47. Ejecting and cocking.

27. Stoppages

a. A stoppage is any unintentional interruption in the cycle of operation. In other words, it is a failure of the rifle to fire through no fault of the firer.

b. Most stoppages occur because of dirty, worn, or broken parts, and lack of lubrication. The rifleman must be taught to watch for these defects and correct them before they cause a stoppage. Some of the more common stoppages with their usual causes and remedies are shown in table I. Note that the stoppages are classified according to the steps of the cycle of operation.

28. Immediate Action

a. *Immediate action is the prompt action taken by the firer to reduce a stoppage.* To apply immediate action, pull the operating rod handle all the way to the rear with the right hand, *palm up*, then release it. Next, aim the rifle and try to fire. The right hand should be held in the manner shown in figure 48 so it will not be injured in the event of a hangfire.

b. If a rifleman is taught to apply immediate action quickly and properly when his rifle fails to fire, he will be able to reduce most stoppages (table I).

29. Malfunctions

A malfunction is a failure of the weapon to function satisfactorily. Some of the common malfunctions are discussed below.

a. The clip may jump out on the seventh round. This is usually caused by a bent follower rod and can be corrected by replacing it.

Table I. Stoppages: Their Causes and Remedies

Stoppages	Cause	Remedy
Failure to feed ----	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Defective or worn parts.	Replace parts.
Failure to chamber.	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Defective ammunition.	Replace ammunition.
	Dirty chamber ----	Clean chamber.
Failure to lock ----	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Dirty locking recesses.	Clean recesses.
	Weak operating rod spring.	Replace spring.
Failure to fire ----	Defective ammunition.	Replace ammunition.
	Defective firing pin.	Replace firing pin.
	Defective trigger housing group.	Repair trigger housing group.
Failure to unlock --	Dirty chamber ----	Clean chamber.
	Lack of lubrication of operating parts.	Clean and lubricate parts.
	Insufficient gas ----	Clean gas port or replace worn parts.
Failure to extract --	Dirty chamber ----	Clean chamber.
	Dirty ammunition.	Replace ammunition.
	Broken extractor --	Replace extractor.
Failure to eject ---	Broken ejector ----	Replace ejector.
Failure to cock ----	Defective trigger housing group.	Repair trigger housing group.

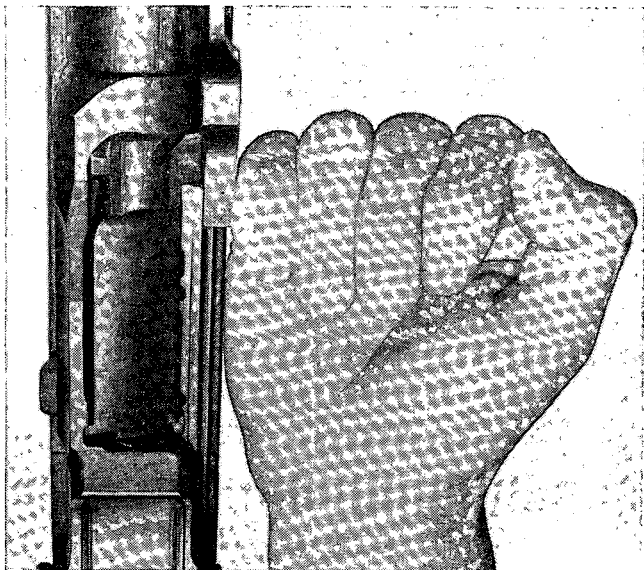


Figure 48. Applying immediate action.

b. The rifle may fire in bursts of two or three rounds. This is due to the sear being broken, worn, or remaining in an open position. It can be corrected by replacing the trigger assembly.

c. The safety may release when pressure is applied to the trigger. This can be caused by a broken safety or by the trigger stop on the safety being worn. It can be corrected by replacing the safety.

Section IV. MAINTENANCE

30. General

Experience has proved that more rifles become unserviceable through lack of proper maintenance than for any other reason. Maintenance includes

all measures taken to keep the rifle in top operating condition. This includes normal cleaning, inspection for defective parts, repair, and lubrication.

31. Cleaning Materials, Lubricants, and Equipment

a. Cleaning Materials.

- (1) Bore cleaner is used for cleaning the bore, chamber, and gas cylinder. It also provides temporary protection from rust.
- (2) Hot, soapy water or plain hot water is a substitute for bore cleaner.
- (3) Dry-cleaning solvent is used for cleaning rifles which are coated with grease, oil, or corrosion-preventive compounds.

b. Lubricants.

- (1) Special preservative lubricating oil is used for lubricating the rifle at normal and low temperatures.
- (2) Medium preservative lubricating oil is used instead of special preservative oil when the rifle is exposed to high temperature, high humidity, or salt water.
- (3) SAE 10 engine oil may be used when the oils prescribed in (1) and (2) above cannot be obtained.
- (4) Rifle grease is applied to parts of the rifle that are subject to heavy wear (fig. 50). This grease has a high resistance to the action of water.

c. Preservatives. A medium corrosion-preventive compound is used to protect the metal parts of the rifle during storage, and raw linseed oil is applied to the wooden parts to prevent their drying.

d. Equipment. The following items of equipment are used in cleaning the rifle: the M10 or M3 cleaning rod with patch tip and rifle bore brush, and the oiler and thong case (fig. 49).

32. Cleaning the Rifle

a. The rifle must be cleaned after it has been fired because firing produces deposits of primer fouling, powder ashes, carbon, and metal fouling. The ammunition now manufactured has a non-corrosive primer which makes cleaning easier, but no less important. The primer still leaves a deposit that may collect moisture and promote rust if it is not removed. The cleaning described below will remove all deposits except metal fouling which is relatively uncommon and is removed by ordnance personnel.

b. The rifle should be field stripped and cleaned in the following manner after it has been fired:

- (1) *Bore.* Run patches dampened with bore cleaner or hot, soapy water back and forth through the bore several times. Next, attach the rifle bore brush to the cleaning rod and run it back and forth through the bore one or two times. Follow this by more wet patches. Run several dry patches through the bore and inspect each patch as it is removed. The bore is clean when a dry patch comes out clean and no evidence of fouling can be seen. Finally, run an oily patch through the bore to leave a light coat of oil inside the barrel.

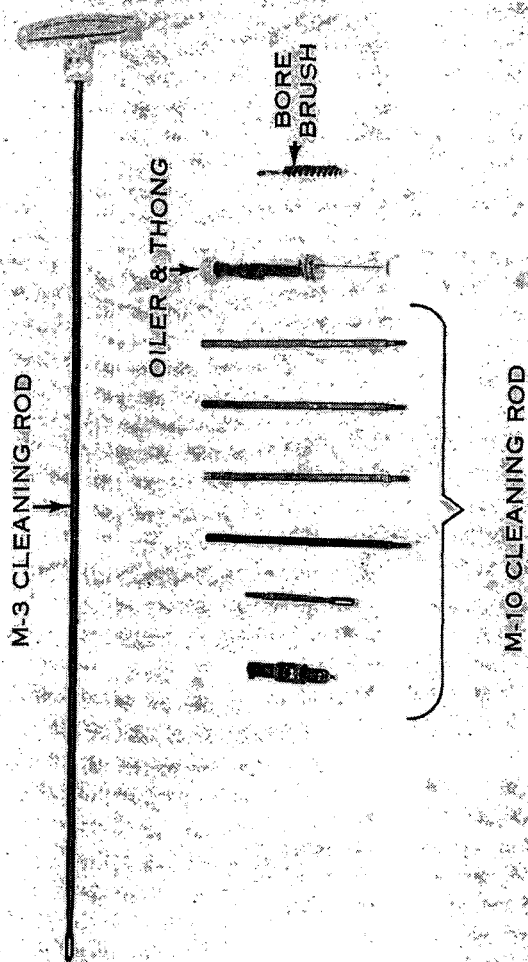


Figure 49. Cleaning equipment.

Note. The patch or brush must be pushed all the way through the bore before it is withdrawn. Care should be taken to prevent the cleaning rod from bearing on the barrel at the muzzle.

- (2) *Chamber.* Insert the M10 or M3 cleaning rod in the bore. Place two patches through the receiver opening into the rod end. Moisten the patches with the applicable cleaning or preservative materials and withdraw them into the chamber while turning the cleaning rod clockwise.
- (3) *Gas cylinder lock screw with valve assembly.* Remove carbon deposits by scraping, then wipe the part and oil it lightly. Check the valve to see that it is not held open by particles of dirt or sand.
- (4) *Piston of operating rod.* Scrub off carbon with bore cleaner. Take care not to damage the piston. Oil it lightly after cleaning.
- (5) *Gas cylinder.* Clean the gas cylinder by the same method described for the chamber.
- (6) *Face of the bolt.* Clean the face of the bolt with a patch and bore cleaner. Remove the bore cleaner with dry patch and then oil the part lightly.
- (7) *All other parts.* Use a bristle brush and a dry cloth to remove all dirt or sand from other parts and exterior surfaces. Apply a light coat of oil to the metal parts and rub linseed oil into the wooden parts.

c. The rifle must be cleaned no later than the evening of the day it is fired. For three consecutive days afterwards check for evidence of fouling by running a clean patch through the bore and inspecting it. The bore should then be lightly oiled.

33. Normal Maintenance

a. The rifle should be inspected daily for evidence of rust and general appearance. A light coat of oil should be maintained on all metal parts. Linseed oil should be applied to wooden parts as necessary to prevent the wood from drying.

b. The daily inspection should also reveal any defective parts, such as cracks in hand guards and burred, worn, or cracked parts. Defects should be reported to the armorer artificer for correction.

c. A muzzle plug should never be used on the rifle. It causes moisture to collect in the bore, which causes the bore to rust.

34. Special Maintenance

a. Before firing, the bore and chamber of the rifle should be cleaned and dried. A light coat of oil should be placed on all other metal parts except those which come in contact with ammunition.

b. Rifle grease should be applied before firing to the parts indicated in figure 50. This is particularly important when the rifle is exposed to rain or salt water. A small amount of grease on the end of a matchstick is applied at each place. The rifle grease is *not* used in extremely cold temperatures nor when the rifle is exposed to ex-

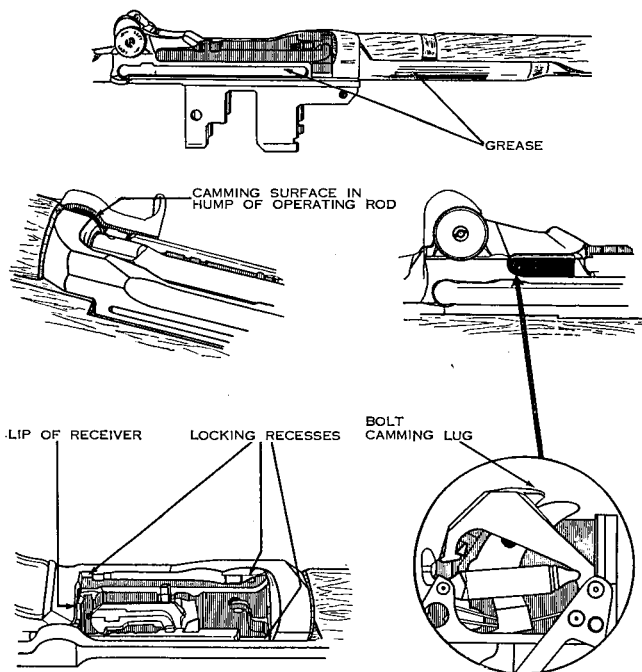


Figure 50. Points to apply rifle grease.

tremes of sand and dust (*a* and *b* below).

c. In cold climates (temperatures below freezing) the rifle must be kept free of moisture and excess oil. Moisture and excess oil on working parts cause them to operate sluggishly or fail completely. The rifle must be disassembled and wiped with a clean dry cloth. Dry-cleaning solvent may be used if necessary to remove oil or grease. Parts that show signs of wear may be wiped with a patch lightly dampened with special preserv-

ative lubricating oil. It is best to keep the rifle as close as possible to outside temperatures at all times to prevent the collection of moisture which occurs when cold metal comes in contact with warm air. If the rifle is brought into a warm room, it should be allowed to reach room temperature so that condensation will occur before cleaning.

d. In hot, humid climates the rifle must be inspected thoroughly each day for signs of moisture and rust. It should be kept lightly oiled with special preservative lubricating oil or, if it is exposed to salt water or salt water atmosphere, with medium preservative lubricating oil. If the rifle is to be fired under these conditions, rifle grease should be applied to the points shown in figure 49. Linseed oil should be frequently applied to the wooden parts to keep out moisture.

e. In hot, dry climates the rifle must be cleaned daily or more often to remove sand or dust from the bore and working parts. In sandy areas, the rifle should be kept dry to prevent the collection of sand. The muzzle and receiver should be kept covered during sand or dust storms. Wooden parts must be kept oiled with linseed oil to prevent drying. The rifle should be relubricated when sandy or dusty conditions decrease or when it begins to show rust.

f. Special instructions on caring for the rifle when it is subject to chemical, biological, or radiological contamination may be found in FM 21-40.

PART TWO
MARKSMANSHIP TRAINING
CHAPTER 3
PREPARATORY MARKSMANSHIP TRAINING

Section I. INTRODUCTION

35. Purpose of Preparatory Marksmanship Training

To become an effective rifle shot, the soldier must be thoroughly trained in the fundamentals of good shooting. Preparatory marksmanship training gives these fundamentals and develops fixed and correct shooting habits. At the same time, it conditions the soldier both mentally and physically for his marksmanship training. Every soldier is required to take preparatory marksmanship training as a preliminary each time he fires on the range, regardless of his previous qualification.

36. Elements of Marksmanship

a. Preparatory marksmanship training develops skill in these five important elements of marksmanship:

Aiming

Positions

Trigger squeeze

Rapid fire

Sight adjustment

The first three elements make up the whole act of firing. In training they must be tied together closely to develop the coordination necessary to perform the act correctly. Rapid fire trains the soldier to fire a number of shots with a minimum loss of time between them. This requires a high degree of coordination and a thorough practical knowledge of the first three elements. Training in sight adjustment teaches the soldier how to use his rear sight so that he can make sight corrections to move the strike of the bullet on the target or to correct for the effect of the wind.

b. The first four elements must be taught in the order shown. Sight adjustment may be taught any time after aiming.

37. Conduct of Training

a. Training is conducted as outlined in Army Subject Schedule 21-31. It is conducted on a 1,000-inch range. However, aiming and sight adjustment may be conducted in other suitable areas, since firing is not required. The *whole method* of marksmanship training is used. This method combines the first three elements of marksmanship early in the training so that the soldier is quickly introduced to the whole act of firing. Here is a brief outline of this method of training: The instructor—

- (1) Teaches correct sight alinement and sight picture, then conducts three aiming exercises.
- (2) Demonstrates the prone position and explains the correct application of trigger squeeze. He then has the soldiers prac-

tice the position and fire three-round shot groups, using the ball and dummy method (par. 60). He repeats this procedure for each of the other positions.

- (3) Conducts the slow fire portion of 1,000-inch instruction firing.
- (4) Demonstrates rapid fire exercises and has the soldiers perform practical work in each.
- (5) Conducts the rapid fire portion of 1,000-inch instruction firing.

b. In addition to permitting early firing, this method does away with long periods of dry exercises on separate elements and permits early detection and correction of errors. If conducted properly, it will improve motivation and sustain the soldier's interest.

38. Use of Coaches

a. Trained coaches who have qualified in a prescribed rifle marksmanship course will be used to give individual instruction in rifle marksmanship training. The minimum requirements for trained coaches are as follows:

- (1) For training in units—one coach per firing point.
- (2) For training in training centers—one coach per firing point for 1,000-inch firing and trigger squeeze instruction; one coach per four firing points for known distance range firing.

b. No soldier who has failed to qualify on a prescribed rifle marksmanship course will actively coach on a firing range. When available, expert

riflemen should be selected and trained as coaches. Emphasis will be placed on the importance of coaching, and instruction will be given in coaching techniques, to include the detection and correction of errors.

c. See appendix VI for a discussion of the techniques of coaching.

Section II. AIMING

39. Sight Alinement and Sight Picture

a. *General.* In aiming the rifle, the firer is concerned with sight alinement and sight picture. Sight alinement is the relationship between the front sight blade and the rear sight aperture, while *sight picture* includes sight alinement and the bull's-eye or other aiming point.

b. *Sight Alinement.* To obtain correct alinement the sights should be alined as shown in figure 51. Notice that the center of the top of the front sight blade is exactly in the center of the rear sight aperture. If an imaginary horizontal line were drawn through the center of the rear sight aperture, the top of the front sight blade would touch this line. If an imaginary vertical line were drawn through the center of the aperture, the line would cut the front sight blade in half.

c. *Sight Picture.* To obtain correct sight picture, the sights are alined properly and the bull's-eye is placed as shown in figure 52. Notice that the bull's-eye appears to be resting on top of the front sight blade. An imaginary vertical line cutting the front sight blade in half would also cut the bull's-eye in half.

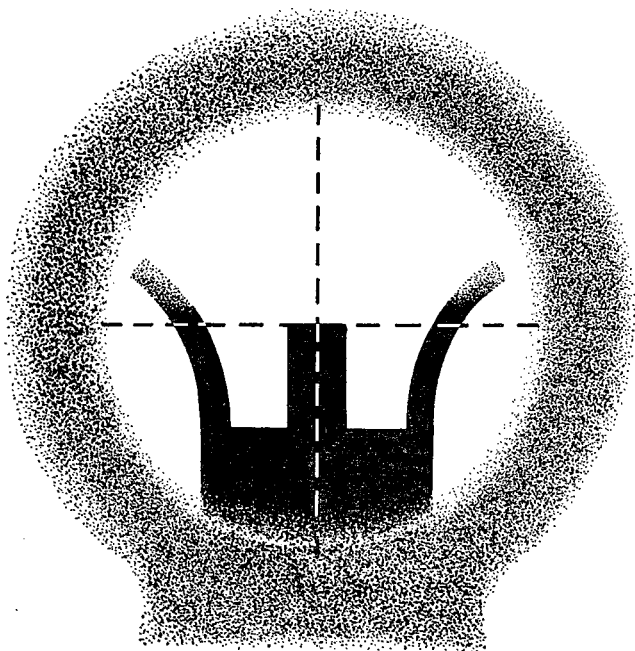


Figure 51. Correct sight alinement.

40. Importance of Sight Alinement

a. The correct relationship between the front sight blade and the rear sight aperture is much more important than the relationship between the bull's-eye and the sights. An error in sight alinement will cause an error on the target which will increase as the range to the target is increased. However, if sight alinement is correct, error in placement of the bull's-eye will cause an error on the target that will be the same for all ranges. Moreover, a small error in sight alinement will cause a larger error on the target than a small

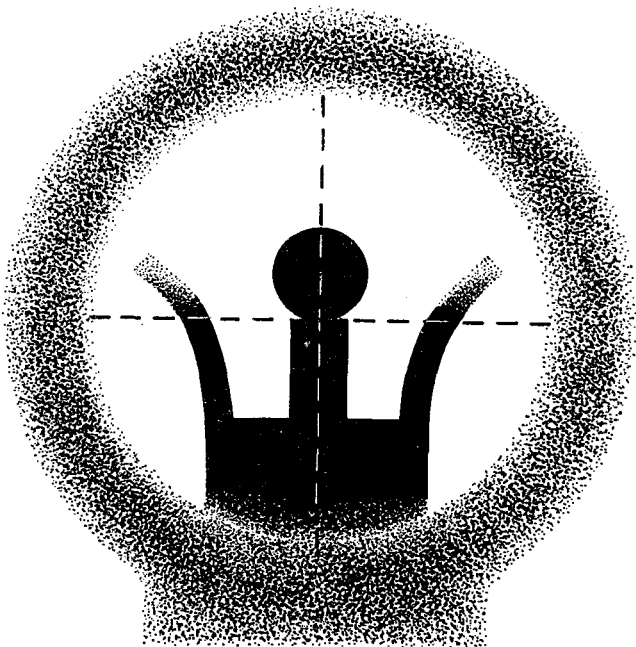
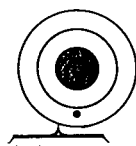


Figure 52. Correct sight picture.

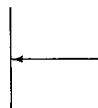
error in the placement of the bull's-eye. Figure 53 shows why this is true.

b. Since it is so important to obtain and hold perfect sight alinement when shooting, the rifleman must concentrate on it as the first and last steps in aiming. That is, he first concentrates on getting a perfect sight alinement, then adds the bull's-eye (or combat target) to get a sight picture and, finally, as he squeezes the trigger, he checks his alinement once more. With practice, these three steps become a continuous, automatic process, and are done in an instant. But no

BULLET STRIKES APPROXIMATELY
13½ INCHES FROM CENTER OF
BULL'S-EYE



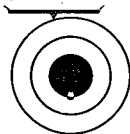
THIS ERROR
WILL INCREASE
AS THE RANGE
IS INCREASED



300 YDS



THIS ERROR
WILL REMAIN
CONSTANT AT
ALL RANGES



BULL'S-EYE POSITIONED CORRECTLY.
ERROR IN SIGHT ALIGNMENT OF 1/2
WIDTH OF FRONT SIGHT BLADE.

PERFECT SIGHT ALIGNMENT
BULL'S-EYE POSITIONED
INCORRECTLY.

Figure 53. Comparison of errors caused by incorrect sight alignment and incorrect placement of the bull's-eye.

matter how quickly they are done, the three steps are always distinct for the simple reason that the human eye can focus at only one distance and on only one point at a time. While a rifleman looks through the aperture, he may focus his eye on either the front sight blade or the bull's-eye, but not on both at once. Therefore, he focuses first on the front sight blade to get sight alinement, then shifts the focus to the bull's eye to get the correct sight picture. Finally, as he squeezes the trigger, he shifts the focus of his eye to the *top portion* of the front sight blade. When he does this, his eye tends to position the top of the front sight blade in the center of the aperture, which insures correct sight alinement. At this point, the firer should see a picture similar to the one shown in figure 54. Notice that the front sight blade stands out clear and distinct, while the bull's eye is fuzzy or hazy.

41. Breathing

a. If a man breathes while trying to aim, the rise and fall of his chest causes his rifle to move and makes it impossible to hold sight alinement and sight picture long enough to shoot accurately. The only way to avoid this movement is to hold the breath for a few seconds. There is a correct way of holding the breath, and the instructor must teach it to his men before he conducts them through the various aiming exercises.

b. This is the correct way to breathe and hold the breath while aiming: Take a normal breath, let part of it out and hold the remainder. Hold it by closing the throat, not by tensing the diaphragm, and do not try to hold it more than 10

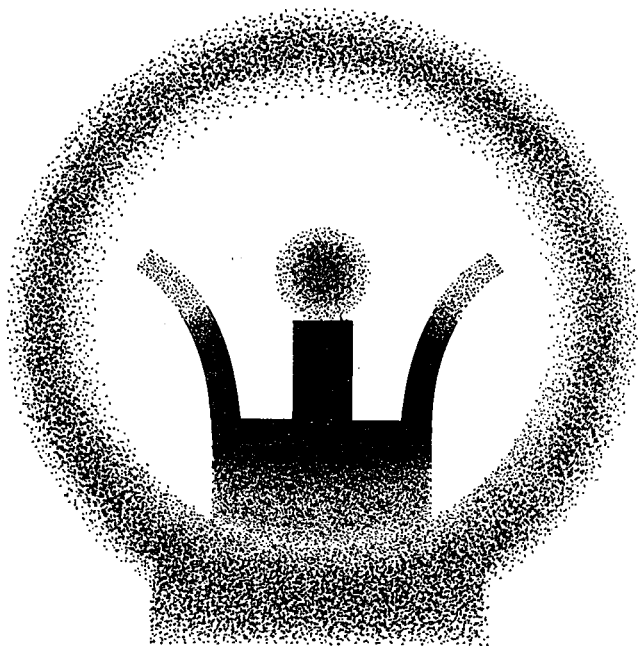


Figure 54. Sight picture with the eye focused on the top portion of the front sight blade.

seconds at a time. Relax with two or three normal breaths between each try and repeat the process as often as necessary.

42. First Aiming Exercise

a. The first aiming exercise is conducted with the aiming bar (fig. 55). The sights on the bar represent those on the rifle. The rear sight is movable, which permits a complete sight picture to be set up. The eyepiece positions the eye so that everyone who looks through it will see the



Figure 55. Coach and firer using the aiming bar.

same sight picture. The main advantage of the aiming bar is its size. Its large sights magnify small errors so that they are easy to see and correct.

b. The exercise is conducted in the following manner:

- (1) The instructor demonstrates correct sight alinement and sight picture, using a large model, a smaller training aid, or a blackboard.
- (2) He then pairs the men in his class and provides each pair with an aiming bar. The men in each pair act alternately as coach and firer. The coach sets up the correct sight alinement and hands the aiming bar to the firer for him to examine. The coach then moves the rear aperture and has the firer set up correct sight alinement. The coach examines this alinement to see that it is correct,

then he sets up small errors in alinement and has the firer detect and correct them. When the coach is satisfied that the firer understands sight alinement, he adds the bull's-eye to the aiming bar and sets up a correct sight picture. After the firer has examined it, the coach removes the bull's-eye and has the firer set up a sight picture. The coach examines the picture and then sets up small errors in sight picture for the firer to detect and correct. The exercise is repeated, the men alternating as coach and firer, until both of them thoroughly understand sight alinement and sight picture. Trained coaches are used to provide individual instruction when needed.

43. Second Aiming Exercise

a. The second aiming exercise gives the men practice in aiming with the rifle sights. The setup for this exercise is shown in figure 56. It requires an instructional group of four men who serve in turn as coach, firer, marker, and operator of an M15 sighting device. Trained coaches are used to provide individual instruction when necessary. The aiming box is 50 feet from the rifle. The rifle is wedged tightly on the rest with the sling. The sights are blackened and the rear sight is set at 12 clicks elevation and zero windage.

b. The exercise is conducted in the following manner: The coach gets into the prone position without touching the rifle, placing both elbows on the ground and resting his chin in the palm of his left hand. He signals to the marker with his right

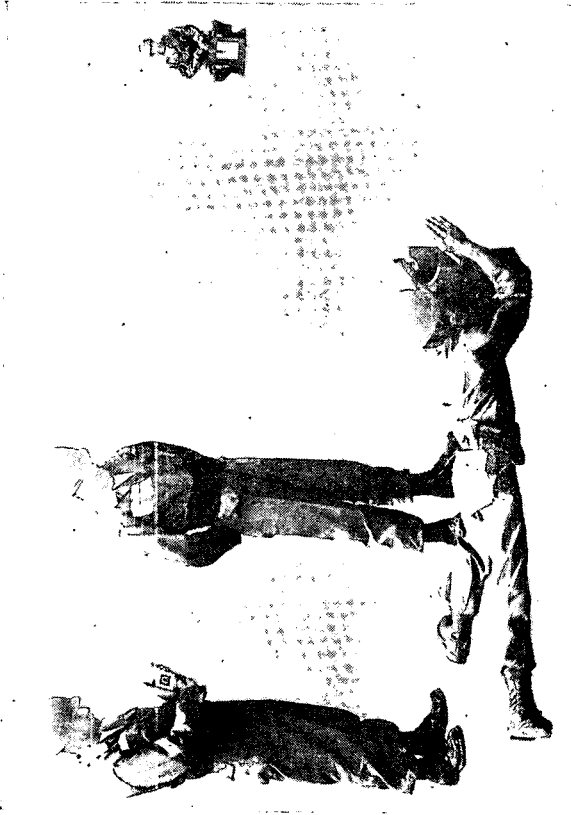


Figure 56. Setup for the second and third aiming exercises.

hand to move the aiming disk until he sees a correct sight picture, then he commands HOLD to the marker. The coach has the firer get into position and look through the sights to see the correct sight picture. He then has the marker move the aiming disk and has the firer set up correct sight picture by motioning to the marker. Following this, the coach sets up small errors in the sight picture and requires the firer to detect and correct them. These same operations are repeated, rotating the men in the various jobs until all members of the instructional group have acted as firer. The instructor should caution them not to disturb the rifle at any time during the exercise.

c. The fourth man in the group sets up sight alinement and sight picture on the M15 sighting device and the coach checks them.

44. Third Aiming Exercise

a. The purpose of the third aiming exercise is to continue aiming practice and to check each man's consistency in aiming. The setup for this exercise is identical to that for the second one. The only addition is a pencil for marking each sight picture.

b. The firer takes the prone position and signals to the marker to move the aiming disk. When he is satisfied that he has the correct sight picture, he commands the marker to HOLD. The coach then gets into position and checks the sight picture. He makes a mental note of any error and gives the command to MARK. The marker places a dot on the paper by inserting the pencil through the hole in the center of the aiming disk. He

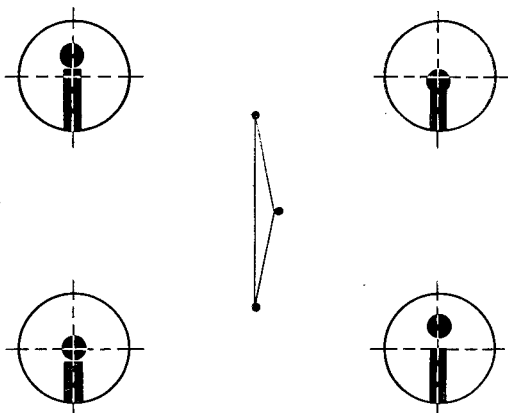
places a number 1 above the dot to indicate that it is the first sight picture. The same firer continues until three of his sight pictures have been plotted. The marker connects the three dots with straight lines to indicate the shot group and writes the firer's name underneath it. The entire instructional group then moves to the aiming box where the coach conducts a critique. At this time he mentions any error he noted during the exercise and comments on the size and shape of the group. The group should be small enough to be covered by the unsharpened end of a pencil or the end of a cigarette. Various types of errors and the shot groups they produce are shown in figure 57. The exercise is complete when each member of the instructional group has made a satisfactory shot group.

Section III. POSITIONS

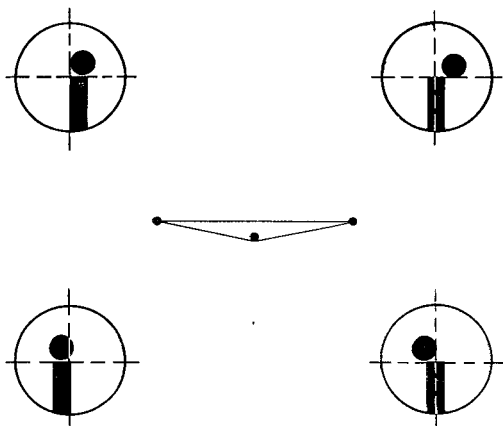
45. General

a. The rifle can be fired in the prone, sitting, squatting, kneeling, standing, and underarm positions. In all except the standing and underarm positions, the firer uses his bones to support the weight of the rifle and uses his muscles principally to hold his bones in their supporting position. This means that he can keep his muscles relaxed and avoid the tremors that develop from strain and tension.

b. A properly adjusted sling relieves the muscles of a lot of strain and helps to steady the rifle so the firer can concentrate more on aiming and trigger squeeze. There are two types of sling adjustment: the loop sling, which is used with



A SHOT GROUP OF THIS TYPE MAY BE CAUSED
BY A COMBINATION OF THE ABOVE ERRORS
IN SIGHT PICTURE



A SHOT GROUP OF THIS TYPE MAY BE CAUSED
BY A COMBINATION OF THE ABOVE ERRORS
IN SIGHT PICTURE

Figure 57. Type shot groups caused by various errors in sight picture.

the prone, sitting, squatting, and kneeling positions; and the hasty sling, which is used with the standing position. The use of the sling is taught in conjunction with the positions.

c. The positions as described in this section have proved to be the best for the average man. All men should be required to try to assume them as prescribed, but those who cannot do so because of their physical conformation may adjust a position to meet their particular need.

46. Adjustment of the Loop Sling

The sling is made from a web material. It has a hook, a buckle, and a clamp or keeper which holds it at the desired adjustment.

a. To adjust the loop sling, place the rifle butt on your right hip and cradle the rifle in the crook of your right arm (fig. 58). This leaves both hands free to adjust the sling. Release the hook from the butt swivel. Hold the buckle in your right hand and pull the sling through the top of the buckle with the left hand, forming a loop. Make the loop large enough to fit your left arm.

b. With your left hand, straighten out the sling and give it a half-turn to the left. Holding the sling with the right hand, insert the left arm through the loop and place the loop well up on the upper arm above the biceps (fig. 59). Tighten the loop and position the buckle on the outside of the arm.

c. With your right hand, loosen the keeper and pull the feed end of the sling toward the butt of the rifle until the desired adjustment is obtained. This adjustment varies with each individual and must be determined through experimentation.



Figure 58. Adjustment of the loop sling.

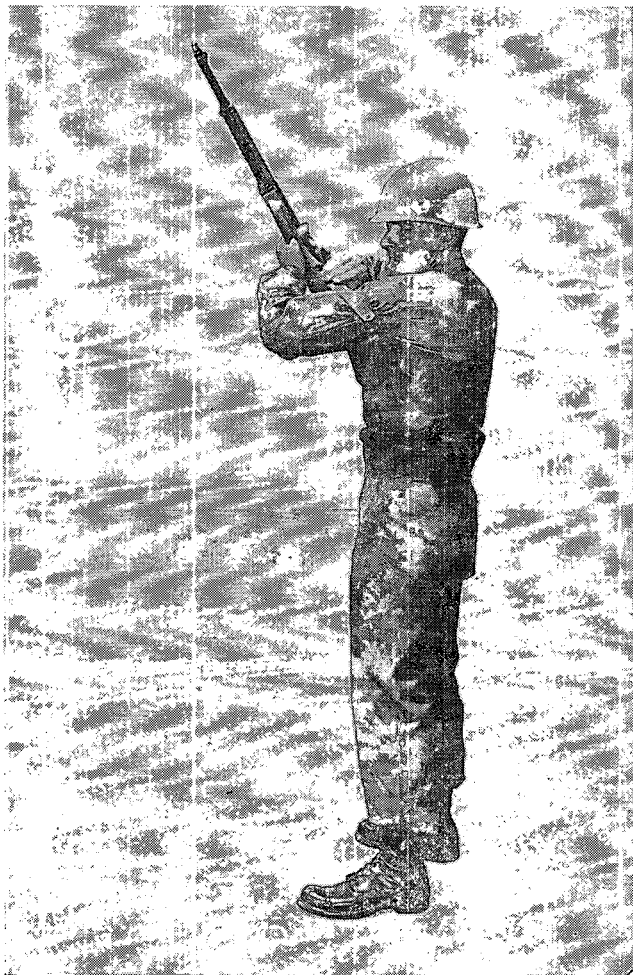


Figure 59. Adjustment of the loop sling (continued from fig. 58).

Move the keeper toward your left arm and tighten it. Place the left hand over the sling and under the rifle, move it forward to the stock ferrule swivel so that the rifle will rest in the V formed by the thumb and forefinger.

d. The length of the sling will vary with each position and must be determined through experience. In all positions, however, the sling should be adjusted so that the rifle has to be forced into the shoulder.

47. Prone Position

a. The prone position is the steadiest and the easiest position to assume (fig. 60). For this reason, it should be used for initial firing so the soldier can concentrate on sight alinement and trigger squeeze. This position presents a low silhouette and can be easily adapted to take advantage of available cover and concealment.

b. To assume the prone position, stand facing your target with your left hand forward to the stock ferrule swivel and your right hand grasping the stock at the heel of the butt. Spread your feet a comfortable distance apart, shift your weight slightly to the rear and drop to your knees. Draw an imaginary line from your right knee to the target. Place the toe of the rifle butt well out on this imaginary line. Pivot on the rifle down onto your left side, placing your left elbow on the imaginary line. With your right hand, force the butt of the rifle into your right shoulder. Grasp the small of the stock with your right hand and lower the right elbow to the ground so that the shoulders are approximately level. Place your

right forefinger on the trigger so that you leave a little space between the finger and the side of the stock. Place the right thumb on top of or over the small of the stock, so that when you look through the sight your cheek will make firm contact with the thumb. This is known as the *spot weld*. To complete the position, relax the neck and relax the weight of the body forward into the sling.

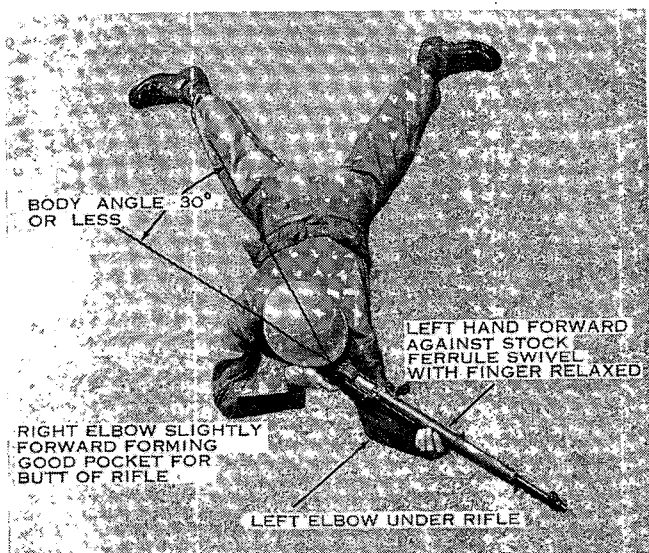


Figure 60. The prone position.

c. Check your position to make sure you are aiming naturally at the target without the slightest pull to the right or left. Do this by closing your eyes for a few seconds and then opening them to see if you are still aiming at the target. If not, shift your body slightly and check again. You

can also check by taking in a breath and letting it out slowly, watching the front sight blade as you do so. The front sight blade should move straight up and down if the position is correct.

d. These are the important features of the prone position:

- (1) The rifle rests in the V formed by the thumb and forefinger of the left hand and across the heel of the hand.
- (2) The fingers of the left hand are relaxed.
- (3) The left hand is forward against the stock ferrule swivel. (A man with a very short arm should use a block such as a rolled up glove or sock between the stock ferrule swivel and his hand. This will permit him to completely relax into the position.)
- (4) The left wrist is straight.
- (5) The left elbow is under the rifle.
- (6) The sling is tight, as evidenced by the space between the sling and the crook of the arm.
- (7) The angle made by the firer's spine and his rifle is 30° or less. This insures that the weight of the body is behind the rifle so the firer can recover quickly after each shot.
- (8) The spine is straight and the legs are spread a comfortable distance apart.
- (9) The toes are pointing outward. The ankles are relaxed so that the heels will rest on the ground, if possible.
- (10) The right elbow is placed far enough to the right to make the shoulders ap-

proximately level and far enough forward to form a good pocket for the butt of the rifle.

- (11) The trigger finger contacts the trigger at a point from the first pad to the second joint so that there is daylight visible between the finger and the side of the stock.
- (12) The neck is relaxed and there must be a firm contact between the cheek and the right thumb which is on top of or over the stock. This spot weld (fig. 61) is very important to good shooting. It positions the eye the same distance from the rear sight for each shot, thus making a firer more consistent in his aiming. The spot weld also enables the

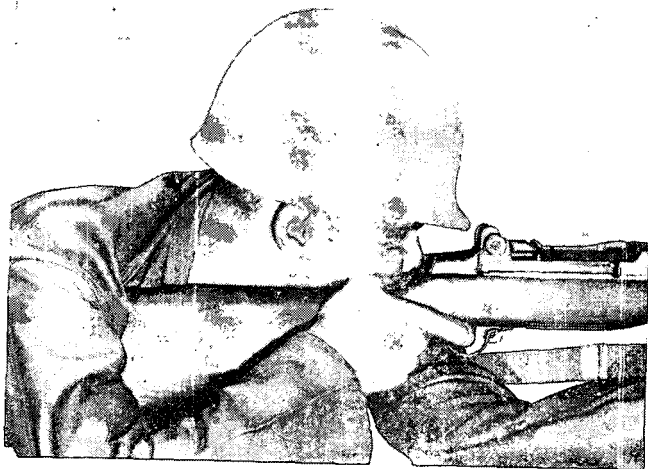


Figure 61. The spot weld.

firer's head to recoil with the rifle, preventing the right thumb from striking the cheek each time the rifle is fired.

- (13) The weight of the upper body is relaxed forward into the sling.

48. Sitting Position

a. The sitting position is second only to the prone position for steadiness. It is particularly suitable for use on ground that slopes downward toward a target. The position can be assumed rapidly, and its high silhouette is desirable when the view of the target is obscured from a lower position.

b. To assume the open-legged sitting position (fig. 62), stand facing your target with your left hand against the stock ferrule swivel and the right hand grasping the stock at the heel of the butt. Execute a half right face and spread the feet wide apart; more than a comfortable distance. Sit down, breaking the fall with your right hand, and slide your buttocks to the rear until your knees are approximately a hand's span off the ground. The feet should be resting on the inside of the heels with the ankles relaxed so that the toes point inward. Bend your body well forward from the waist and place the left upper arm on the flat portion of the shinbone so that the tip of the elbow crosses over it. There should be several inches of contact between the left upper arm and the shinbone. Force the rifle into the shoulder with the right hand and then take the proper grip on the small of the stock. Block your right elbow inside the right knee. To complete the position,

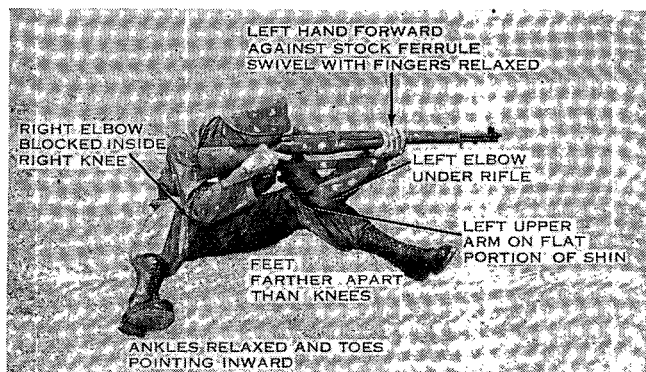


Figure 62. The open-legged sitting position.

obtain a spot weld and relax the weight of your upper body into the sling. Check to see that you are aiming naturally on your target in the same manner described for the prone position.

c. These are the important features of the open-legged sitting position.

- (1) The rifle rests in the V formed by the thumb and forefinger of the left hand and across the heel of the hand.
- (2) The fingers of the left hand are relaxed.
- (3) The left wrist is straight.
- (4) The left elbow is under the rifle.
- (5) The sling is tight, as evidenced by the space between the sling and the crook of the arm.
- (6) The left upper arm has several inches of contact with the flat portion of the shinbone, and the tip of the elbow extends beyond it.
- (7) The upper body is relaxed well forward at the waist.

- (8) The right elbow is blocked inside the right knee.
- (9) The feet are farther apart than the knees with the ankles relaxed and toes pointing inward.
- (10) The spot weld and the position of the right hand and the trigger finger are the same as for the prone position.

49. Alternate Sitting Positions

a. General. There are two alternate sitting positions which may be used only when a man's body conformation will not permit him to assume a satisfactory open-legged position. The alternates are not as stable as the open-legged position because they both have only a two-point base.

b. Cross-Legged Position. To assume the cross-legged position (fig. 63), stand facing your target with your left hand against the stock ferule swivel and your right hand grasping the stock at the heel of the butt. Execute a half right face and spread your feet a comfortable distance apart. Sit down and cross your left leg over your right leg. Draw your feet up close to your body so that the outer part of the calf of each leg rests on the inside of the opposite foot. Both upper arms are supported against the shinbones. The rest of the position is the same as for the open-legged sitting position.

c. Cross-Ankled Position. To assume the cross-ankled position (fig. 64), stand facing your target with your left hand against the stock ferule swivel and your right hand grasping the stock at the heel of the butt. Execute a half right

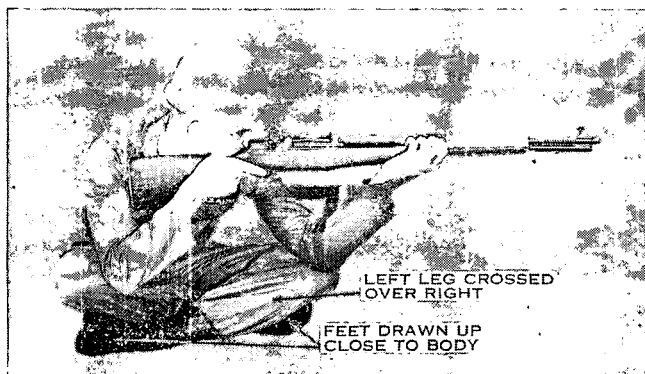


Figure 63. The cross-legged sitting position.

face and spread your feet a comfortable distance apart. Sit down, cross your left ankle over your right, and extend your legs well away from your body. The upper arms are supported against the shinbones. Each man may adjust the position to his particular need by varying the distance the



Figure 64. The cross-ankled sitting position.

legs are extended. The rest of the position is the same for the open-legged sitting position.

50. Kneeling Position

a. The kneeling position (fig. 65) is particularly good on ground that slopes upward toward the target. It is a higher position than the sitting and prone, and is useful when the target cannot be clearly seen from the lower positions. This is also a good position to use when steadying the rifle on a support such as a tree stump or fence rail.

b. To assume the kneeling position, stand facing the target with your left hand against the stock ferrule swivel and the right hand grasping the stock at the heel of the butt. Execute a right face, then place your left foot about 18 inches to the left front with the toe pointing in the general direction of the target. Kneel on your right knee, keeping the right toe in place. Sit with your right buttock on your right heel. Place the left elbow forward of the left knee, resting the flat portion of the upper arm on the knee. Force the rifle into your right shoulder and grasp the small of the stock with the right hand. The right elbow is horizontal or slightly below to form a good pocket for the rifle butt. To complete the position, shift your weight forward onto your left leg and relax into the sling. Approximately 60 percent of your weight should be on your left leg.

c. Check to see that you are aiming naturally on your target in the same manner described for the prone position.

d. These are the important features of the kneeling position:

BODY WEIGHT
FORWARD

LEFT ELBOW
FORWARD OF
KNEE AND
UNDER RIFLE

RIGHT ELBOW
HORIZONTAL
OR SLIGHTLY
BELOW

CONTACT BETWEEN
LEFT CALF AND
THIGH

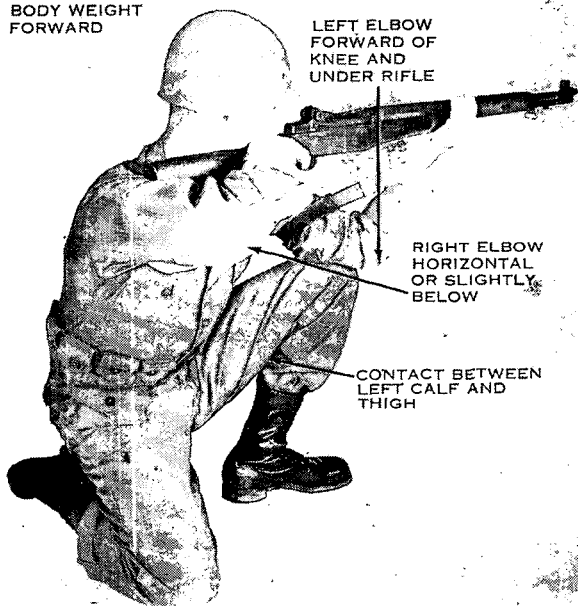


Figure 65. The kneeling position.

- (1) The rifle in the V formed by the thumb and forefinger of the left hand and across the heel of the hand.
- (2) The fingers of the left hand are relaxed.
- (3) The left wrist is straight.
- (4) The left elbow is under the rifle with the flat portion of the upper arm on the knee. This avoids point-to-point contact between the elbow and the knee.
- (5) The sling is tight, as evidenced by the space between the sling and the crook of the arm.

- (6) The left lower leg is vertical as viewed from the front.
- (7) The toe of the left foot points generally in the direction of the target. (It may be pointed slightly to the right to reduce side sway.)
- (8) There is solid contact between the left calf and the left thigh. The left foot should be drawn closer to the body if this contact is not made when the weight is shifted forward.
- (9) The right knee is placed on the ground so that the right thigh forms an angle of 90° with the line of aim. The entire surface of the right lower leg, from knee to toe, is in contact with the ground. The leg completes a solid, three-point base for the position.
- (10) There is contact between the right buttock and the right heel. The firer first sits on the right heel and, when he shifts his weight forward, he should move the right heel forward to maintain this contact.
- (11) The right elbow is level with the right shoulder or slightly below, forming a good pocket for the rifle butt.
- (12) The spot weld and the position of the right hand and trigger finger are the same as for the prone position.
- (13) The weight of the body is relaxed forward so that approximately 60 percent of the body weight is over the left leg.

51. Alternate Kneeling Positions

a. Man With Unusually Long Legs. A man with unusually long legs may aim too high in the normal kneeling position. He can correct this by adopting one or a combination of the following position variations. They all have the effect of lowering the muzzle.

- (1) Move the left foot out beyond the left knee as far as necessary to lower the muzzle to the desired degree.
- (2) Move the left elbow farther over the left knee.
- (3) Turn the toe of the right foot under. This raises the body slightly and the rear of the rifle along with it.

b. Man With Unusually Short Legs. A man with unusually short legs may aim too low in the normal kneeling position. Both of the following position variations have the effect of raising the muzzle. (The second variation may also be used by a man who cannot otherwise eliminate the strain on the instep of the right foot.)

- (1) Move the left foot forward until it is directly underneath the knee.
- (2) Sit on the inside of the right foot.

52. Squatting Position

a. The squatting position (fig. 66) is a steady position and can be assumed very quickly. It is good for firing in mud, shallow water, or contaminated areas, since only the feet are in contact with the ground.

b. To assume the squatting position, stand facing the target with your left hand against the

stock ferrule swivel and your right hand grasping the stock at the heel of the butt. Execute a half right face and spread your feet a comfortable distance apart. Your weight should be equally distributed on both feet. Squat as low as possible and place the left upper arm on the flat portion of the left knee. Force the butt of the rifle into the right shoulder and grasp the small of the stock with the right hand. Lower your right arm and block it inside the right knee. Complete the position by relaxing into the sling. Check to see that you are aiming naturally at your target in the same manner described for the prone position.

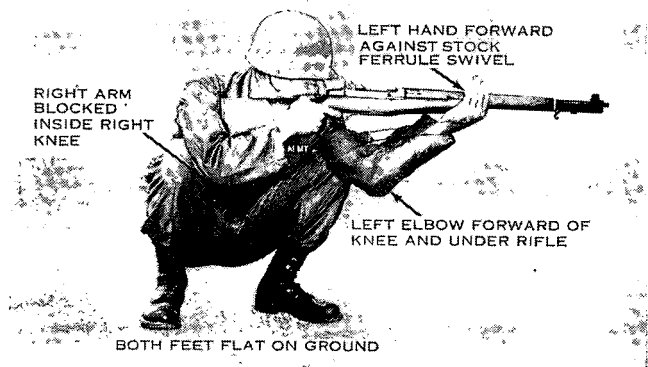


Figure 66. The squatting position.

c. These are the important features of the squatting position:

- (1) The rifle rests in the V formed by the thumb and forefinger of the left hand and across the heel of the hand.
- (2) The fingers of the left hand are relaxed.
- (3) The left wrist is straight.

- (4) The left elbow is under the rifle and forward of the left knee.
- (5) The sling is tight, as evidenced by the space between the sling and the crook of the arm.
- (6) Both feet are flat on the ground.
- (7) There is maximum contact between the calves and thighs of both legs.
- (8) The right arm is blocked inside the right knee.
- (9) The spot weld and the position of the right hand and trigger finger are the same as for the prone position.
- (10) The weight is relaxed forward over the left leg.

53. Adjustment of the Hasty Sling

The hasty sling adjustment (fig. 67) is used with the standing position. It may be used with other positions when there is not enough time to make another adjustment. To adjust the hasty sling, the hook must be fastened to the butt swivel. Place the butt of the rifle on your right hip and cradle it in the crook of your right arm so that both hands are free. Loosen the keeper and draw the sling down until it is even with the rifle butt. (This adjustment in length is only a starting point. Each man must determine his own adjustment by experimenting.) Move the keeper forward near the stock ferrule swivel and fasten it. Give the sling a half-turn to the left and pass your left arm through the sling. Place the sling high up on the left upper arm. Move your left hand over the sling and grasp the rifle at the balance.



Figure 67. Hasty sling adjustment.

54. Standing Position

a. The standing or off-hand position (fig. 68) is used for ranges of 100 yards or less. It is not a steady position, but very accurate fire can be delivered from it when properly used. It lends itself well to the use of support such as the rifleman has when firing from a window or from behind a tree or the corner of a building.

b. To assume this position, stand facing the target with your left hand at the balance of the rifle and your right hand at the heel of the butt. Execute a right face and spread your feet a comfortable distance apart. The weight of your body

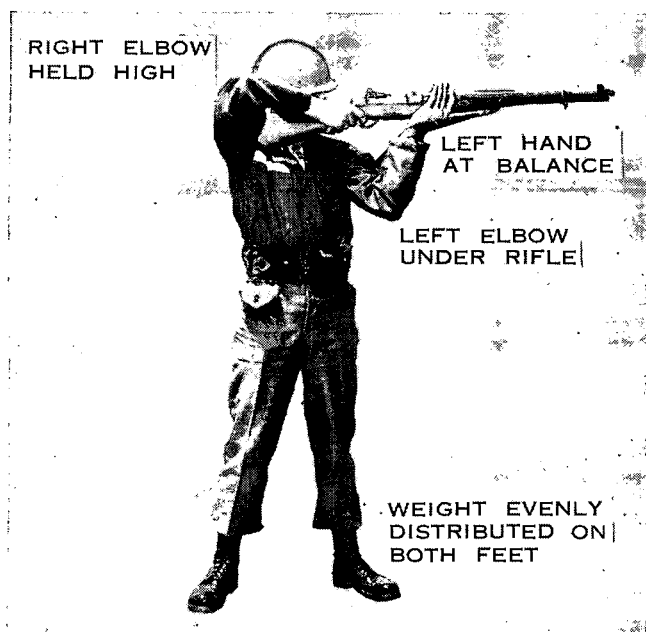


Figure 68. The standing position.

should be equally distributed on both feet. With the right hand, raise the butt of the rifle upward until the sights are level with your eyes. Place the toe of the butt against your right shoulder so that about one-half of it is visible above your shoulder when viewed from the rear. Raise your right arm high into the air, then bend it at the elbow until the right hand can grasp the small of the stock. Take a firm grip on the small of the stock and pull the rifle into the shoulder. Relax your weight straight down onto your hips. Check to see that you are aiming naturally at the target. If not, move your right foot backward or forward to adjust your position.

c. These are the important features of the standing position:

- (1) The left hand is at the balance with the rifle resting in the V formed by the thumb and forefinger and across the heel of the hand.
- (2) The left elbow is under the rifle but not touching the body.
- (3) The sling is tight and high on the upper arm.
- (4) The right elbow is approximately 45° above the horizontal. This is necessary because the right arm must hold most of the weight of the rifle, while the left hand only steadies it. The high right elbow also forms an adequate pocket in the shoulder for the butt.
- (5) The right hand grasps the small of the stock firmly and pulls the rifle into the right shoulder.

- (6) The trigger finger is placed on the trigger in the same manner described for the other positions. The spot weld between the cheek and the thumb is used if possible. If not, the cheek is pressed firmly against the stock.
- (7) The body is erect with the weight of the trunk relaxed straight down onto the hips.
- (8) The feet are spread a comfortable distance apart with the body weight distributed equally on both feet.
- (9) The firer is in position to aim naturally at his target.

55. Sandbag Rest Position

The sandbag may be used for zeroing in the prone position. To get into the sandbag rest position (fig. 69), the firer first of all takes a correct prone position. The coach stands a sandbag that is about three-fourths full beside the firer's left arm so that the seam faces the firer. He then arranges the bag so that it is slightly higher than the firer's left hand and makes a groove in the bag for the firer's hand to fit into. Straddling the rifle and facing the firer, he places the sandbag under the rifle and pushes it against the firer's left hand. He makes sure that no part of the rifle touches the sandbag and that there is a maximum contact between the firer's left arm and hand and the sandbag.

56. Underarm Position

a. The underarm position (fig. 70) is used to place well-directed fire on suspected enemy posi-



Figure 69. The sandbag rest position.

tions at extremely short ranges (up to 50 yards). It is effective during the final stages of an assault, in jungle and street fighting, and in any situation where the enemy can be located only by his weapon's flash, a sound, or his vague outline.

b. To assume the underarm position, stand facing your target with your feet wide enough apart to provide balance. Place the left foot slightly forward as in a boxer's stance. Bend your knees slightly and lean forward from the hips to provide a comfortable firing position. Grasp the small of the stock with your right hand and hold the side of the stock at the butt against the right side of your body about halfway between the armpit and the hip. The right upper arm is on the outside of the stock. Grasp the rifle with the left hand just back of the stock ferrule swivel, bending the left arm slightly at the elbow. To aim, point the rifle in the direction of the target with the barrel horizontal or the muzzle slightly depressed. It is better to get a low hit near the target than a high miss, because you can adjust your pointing with more certainty from the observed hit. You should be able to keep the muzzle of the rifle within your field of vision while focusing your eyes on the target. By doing this you increase your ability to point the rifle properly. You can engage a new target in another direction simply by pivoting your entire body.

c. These are the important features of the underarm position:

- (1) The firer has a well-balanced and stable stance.
- (2) The knees are slightly bent and the body is bent forward from the hips.

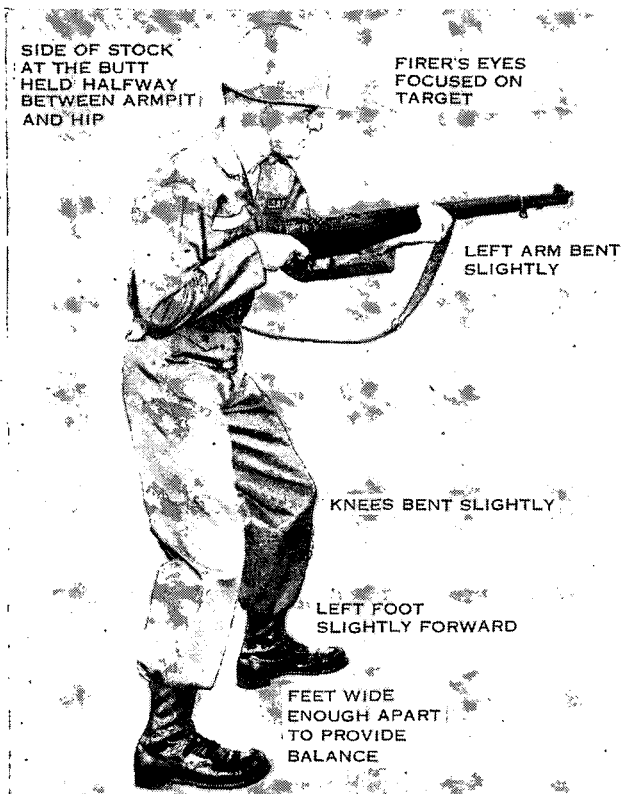


Figure 70. The underarm position.

- (3) The side of the stock at the butt is held firmly against the side of the body, half-way between the armpit and the hip. The right upper arm is on the outside of the stock.
- (4) The left hand holds the rifle just back of the stock ferrule swivel and the left arm is bent slightly at the elbow.

- (5) The rifle is pointed in the direction of the target with the barrel horizontal or the muzzle slightly depressed.
- (6) The firer's eyes are focussed on the target.

Section IV. TRIGGER SQUEEZE

57. Importance of Trigger Squeeze

Poor shooting is usually caused by the aim being disturbed just before the bullet leaves the barrel and is the result of the firer *jerking the trigger* or *flinching*. The trigger does not have to be jerked violently to spoil the aim; even a slight sudden pressure of the trigger finger is enough to cause the barrel to waver and ruin the firer's sight alinement. Flinching is a movement of the body caused by the firer tensing his muscles in anticipation of the recoil. It can have a worse effect on the aim than jerking the trigger. A firer can correct both of these shooting errors by understanding and applying trigger squeeze. Correctly applied trigger squeeze causes no movement of the barrel; also, it prevents the rifleman from knowing exactly when the rifle will fire, thus helping him to avoid flinching. For these reasons, trigger squeeze is the most important single element in the act of firing the rifle.

58. Application of Trigger Squeeze

a. Trigger squeeze may be defined as the independent action of the forefinger on the trigger, straight to the rear, with a uniformly increasing pressure until the rifle fires. The trigger slack, or free play, is taken up first and the squeeze is con-

tinued steadily until the hammer falls. If this is done properly, the firer will not know when the hammer will fall and, if he does not know when the hammer will fall, he will not know when to flinch. To apply correct trigger squeeze, the forefinger must be correctly positioned on the trigger (fig. 71). The finger may contact the trigger anywhere from the first pad to the second joint, depending on its length. The important thing is not to let the finger touch the side of the stock, because this interferes with the application of pressure straight to the rear.

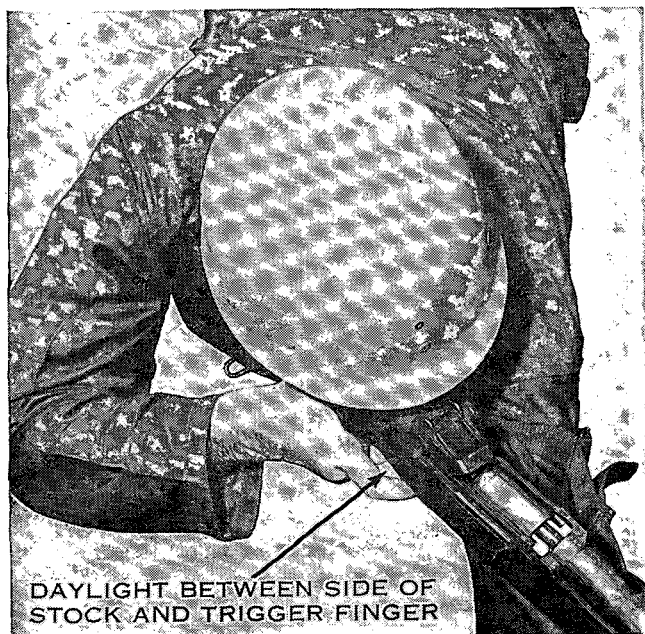


Figure 71. Correct trigger finger position.

b. Trigger squeeze must be combined with aiming and position before it can be learned properly. To do this the firer assumes a correct position with his rifle pointed at the target, takes in a normal breath and lets part of it out, locking the remainder in his throat. He then relaxes, aims at the target and gets perfect sight picture and alinement, takes up the slack, and squeezes the trigger straight to the rear with a steadily increasing pressure until the hammer falls. If he does not squeeze off the round in eight or nine seconds, he should stop, relax, and start the process over again.

c. The sequence of actions that make up this process can be summed up by the code word BRASS. It is a word the rifleman should think of every time he fires his weapon—

B reathe—take a normal breath, let part of it out, and lock the remainder in the throat.

R elax—relax the muscles completely, letting the sling help you do this.

A im—complete the aim, focusing the eye on top of the front sight blade.

S lack—take up the trigger slack.

S queeze—squeeze the trigger straight to the rear until the hammer falls.

d. An unsteady position will cause many firers to squeeze the trigger hurriedly the instant they have a perfect sight picture. This is called snap shooting and is a habit which should be avoided. The unsteadiness or *wobble* can never be eliminated entirely when shooting in the standing and kneeling positions, but the firer can overcome

this difficulty by *controlling the squeeze*. This is the way he can control the squeeze: as soon as he has the correct sight picture he should increase his finger pressure on the trigger while concentrating on sight alinement. When a wobble causes him to lose the sight picture, he should hold what pressure he has and continue the squeeze when he again has the correct sight picture.

59. Follow Through and Calling the Shot

a. Each time a rifleman squeezes off a round he must continue to aim and continue to squeeze the trigger for a second or two after his weapon fires. This is called *follow through*. When a rifleman follows through, he does not have a tendency to come out of position before the round leaves the barrel by moving his head or letting the muzzle drop. By holding his aim and squeezing (following through), he can tell with certainty what sight picture he has at the instant the bullet leaves the barrel and he knows where it will strike the target. In other words, he can *call the shot*.

b. Throughout marksmanship training, the rifleman should be required to call each shot by announcing aloud where the bullet should strike the target according to the sight picture he has at the instant he fires. See figure 72, which illustrates how shots are called. A man who can call his shots consistently will develop into an excellent marksman.

60. Coaching Techniques for Trigger Squeeze Training

Trained coaches must be used for this training and each firer must be coached individually. The instructor divides the class into groups and desig-

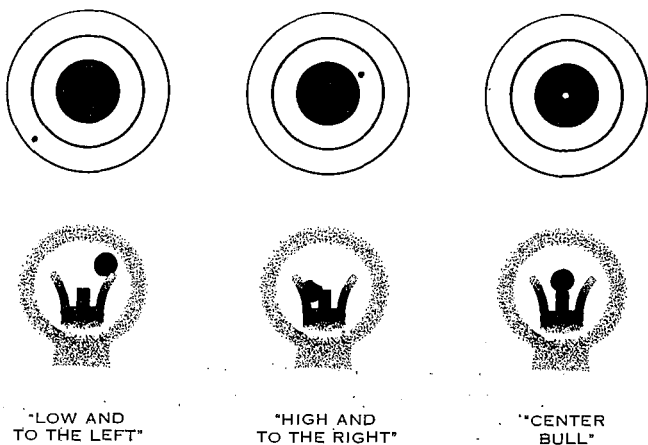


Figure 72. Calling the shot.

nates a coach for each. The size of the groups depends on the number of trained coaches available. When there are few coaches and each one has a large group of men to take through the exercises, additional time must be allotted for this training. Before turning the groups over to their coaches, the instructor explains trigger squeeze to the entire class, following the text of paragraphs 57 and 58. The coaches then start the practical training according to the sequence and techniques discussed in *a* through *e* below.

a. The coach must be able to observe the firer and the target. He can do this best by taking a position similar to the firer's with his head within a two-foot radius of the firer's head. The coaching positions are described below.

- (1) *Prone.* The coach lies on the firer's right, with his feet in the same direction

as the firer's feet. He supports his head with his right hand (fig. 73 ①).

- (2) *Sitting*. The coach sits on the firer's right and faces him as shown in figure 73 ②. In the open-legged sitting posi-



① The coach in correct position (prone)



② The coach in correct position (sitting)

Figure 73.

tion, the coach may place his right leg underneath the firer's right leg so he can sit close to him.

- (3) *Kneeling.* The coach kneels on the firer's right, facing him (fig. 73 ③).
- (4) *Squatting.* The coach sits on the firer's right, facing him (fig. 73 ④).
- (5) *Standing.* The coach stands on the firer's right, facing him (fig. 73 ⑤).

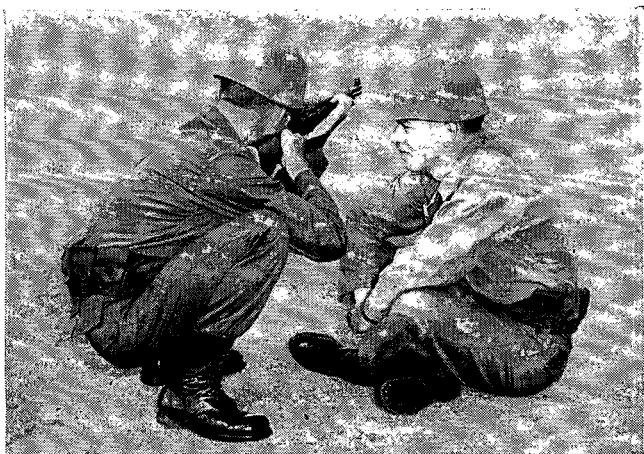
Note. The coach must place himself at the left of a left-handed firer, facing him. During rapid fire exercises when it is necessary for him to strike the operating rod handle to the rear, he assumes a position on the right side of the firer.

b. The coach must be especially watchful for faulty trigger squeeze because it is the usual cause of occasional wild shots. Faulty trigger squeeze can be detected easily with beginners, but it be-



③ The coach in correct position (kneeling)

Figure 73—Continued.

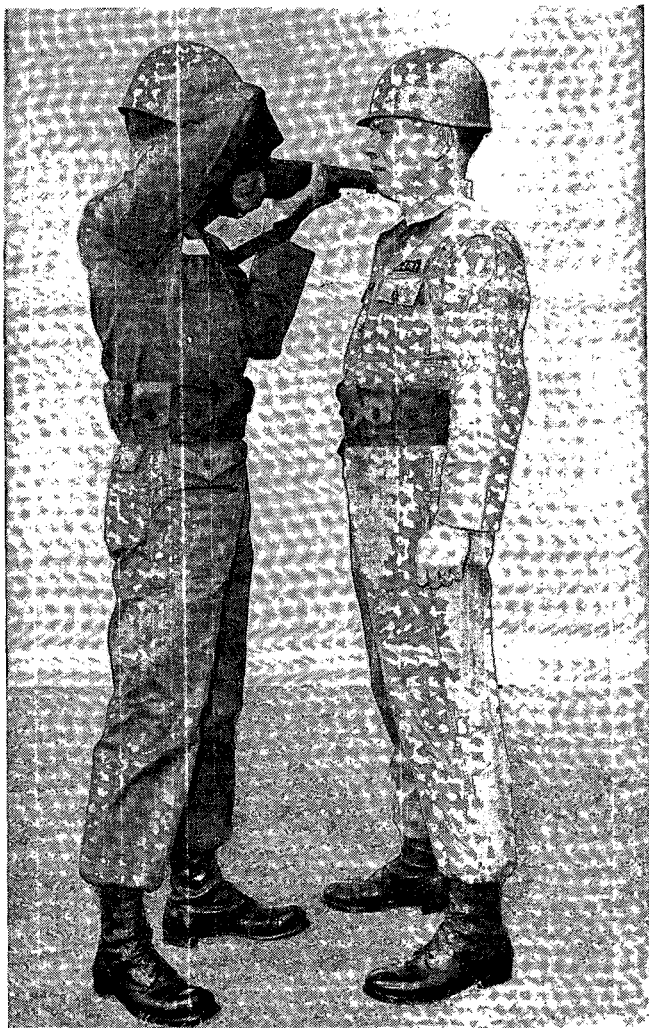


④ The coach in correct position (squatting)

Figure 73—Continued.

comes more difficult with experienced shooters. The coach must be familiar with the common causes of faulty trigger squeeze in order to effectively detect and correct the error. It may be recognized by the following reactions of the firer:

- (1) *The flinch.* This is the firer's reaction to the anticipated recoil or the noise of the exploding round. It may be indicated by the firer moving his head, closing one or both eyes, tensing his left arm or hand, or moving his shoulder slightly to the rear.
- (2) *The buck.* This is an attempt by the firer to take up the recoil by tensing his shoulder muscles or moving his shoulder forward.
- (3) *The jerk.* This is an attempt by the firer to make the rifle fire at a certain



⑤ The coach in correct position (standing)

Figure 73—Continued.

desired time by rapidly applying pressure on the trigger. He may try to fire the instant he has a correct sight picture or he may fire too quickly because he has held his breath too long.

c. It is hard to detect these faults with some firers, because they give little or no observable indication other than the occasional wild shot. The voluntary or involuntary muscular reactions occur the instant before the rifle fires or at the moment it fires. The visible reaction may be in the trigger finger, the head, the eyes, the right shoulder, the left hand or arm, or the whole body. The coach cannot watch all of these points at the same time. He should concentrate on the feature that gives the most consistent and characteristic indication of the fault. For example, when firing from the standing position the flinch will most likely be indicated by a movement of the head or shoulder. Every man's reaction to firing the rifle is different and the coach must be alert to spot the muscular contraction that points to the fault.

d. When, by observation of the firer or of his target, the coach suspects or detects with certainty a faulty trigger squeeze, he should correct the firer by taking him through the following sequence:

- (1) Have him relax.
- (2) Explain the cause of his faulty trigger squeeze (flinching, bucking, or jerking).
- (3) Check his position and correct it if necessary. Have him use earplugs (patches) and shoulder padding.

(4) Check the firer closely while using the *ball and dummy method*. The coach has him turn his head to one side while he loads either a ball or dummy round. Then the coach talks the firer through the sequence of firing - (BRASS). He tells the firer to concentrate on sight alinement. If he does not squeeze the trigger in eight to nine seconds, the coach has him relax and start again. He has the firer call each shot and tell what he did wrong on each one. For example, the firer may say that he let his sights move out of alinement or that he held his alinement but allowed his sights to move completely away from the bull's eye. He may notice that he flinched, bucked, or jerked the trigger. While using the ball and dummy method, the coach should watch the firer for any evidence of muscular contraction and watch his expression after the hammer falls on a dummy round. If the firer reacts incorrectly, he will realize it and the coach can detect it by the surprised and sometimes guilty expression on his face.

e. The procedure described in *d* above should be continued until the exact cause of faulty trigger squeeze is determined and the firer is convinced of what he is doing wrong. The use of ball and dummy should be continued throughout training in all positions and at intervals during instruction firing for instructional purposes as well as for assurance that the firer has been cured.

f. These additional exercises can be used to improve trigger squeeze:

- (1) *Blank firing target exercises.* This exercise helps a firer who has the tendency to jerk the trigger once he attains perfect sight picture. The firer is told to fire a shot group at a blank piece of paper or to one side of the bull's-eye. Without the bull's-eye as an aiming point, he can concentrate on his sight alinement. The exercise proves to him the importance of sight alinement and that he can squeeze the trigger properly.
- (2) *Tin disk exercise.* The coach has the firer assume a position and then places a dime-size disk on top of the barrel just behind the front sight. He has the firer try to squeeze the trigger without dislodging the disk.
- (3) *Exercise with the M2 aiming device.* This device (fig. 74), which fits over the rear sight, is a valuable aid for the coach in detecting errors in squeezing the trigger as well as errors in aiming. A piece of smoked glass inside the device enables the coach to see a reflection of the sight picture the firer sees. By watching through the device, the coach can determine if the firer is obtaining the correct sight picture, if he is squeezing the trigger properly, and if he is calling his shots correctly. The coach must keep in mind that the device shows him the firer's sight picture in reverse. That is, if the

- firer calls a shot to the left, the coach will see it to the right. It takes considerable practice on the part of the coach to use the device effectively, and he should follow these techniques closely:
- (a) Look straight into the device, adjusting his position as necessary to do so.
 - (b) Maintain a steady position and hold

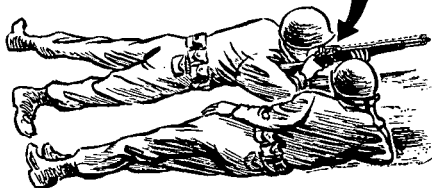
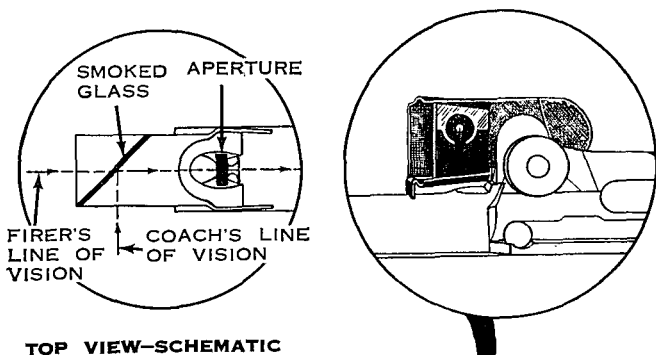
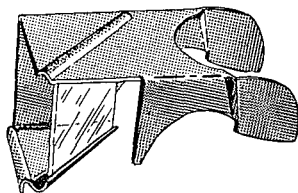


Figure 74. The M2 aiming device.

his breath while checking the firer's sight alinement and picture.

- (c) Watch for any sudden change in the sight picture the instant before the rifle fires. Sudden changes indicate that the firer is either jerking the trigger or flinching.

Section V. RAPID FIRE

61. General

a. Rapid fire is a series of aimed shots fired at regular, short intervals. Accuracy in rapid fire, as in slow fire, requires a steady aim, a good position, and proper trigger squeeze, but in rapid fire these elements are blended together by a high degree of coordination and there is a minimum loss of time between shots. The rifleman must be trained in rapid fire to develop his ability to fire and reload rapidly so he can take full advantage of the rifle's firepower capability.

b. In rapid fire training, a time limit of 50 seconds has been established for firing nine rounds (one loose round and one clip of eight rounds). The firer must assume a position rapidly, fire the first round, reload a full clip, and squeeze off the remaining rounds. These actions are broken down into five exercises which are taught in the following order:

- (1) Taking positions rapidly.
- (2) Reloading.
- (3) Developing cadence.
- (4) Performing a 50-second exercise with dummy rounds.

- (5) Performing a 50-second exercise with a clip containing a wooden block. (This exercise is substituted for the fourth one when dummy rounds are not available.)

c. A time breakdown for the full rapid fire exercise is shown on the chart below. Notice that 10 seconds are allowed to assume the position and fire the first round. Ten more seconds are allowed to load a full clip and fire the second round. Four seconds are then allowed for each succeeding round, making a total of 48 seconds. This is considered to be the ideal time limit. Two seconds are added as a reserve.

Chart II. Rapid Fire Time Allowance

Round No.	1	2	3	4	5	6	7	8	9	
Number of seconds per round.	10	10	4	4	4	4	4	4	4	2 (reserve).
Cumulative time in seconds.	10	20	24	28	32	36	40	44	48	50 (total).

d. Throughout all rapid fire training, the instructor must stress that *accuracy is never sacrificed for speed*. Riflemen must be drilled to perform all exercises deliberately and without hurrying.

62. First Rapid Fire Exercise (Taking Positions Rapidly)

a. *Description.* The first rapid fire exercise consists of the procedure for taking the prone and sitting positions rapidly and firing the first round in 10 seconds. The positions are assumed in the

normal manner, but it takes practice to learn to assume them quickly and squeeze off a round in the time allowed.

b. Taking the Prone Position Rapidly. The firer first assumes a correct prone position, taking his time, and checks to see that he is aiming naturally at his target. The coach checks the position to see that it is correct. The firer drops the rifle from his shoulder and marks the spot where the butt strikes the ground. He also marks the location of his elbows. He then rises, keeping his feet in place, and stands ready with his left hand against the stock ferrule swivel and his right hand grasping the heel of the stock. On the coach's command, the firer again takes the prone position, quickly but carefully placing the butt of his rifle on the spot marked for it and his elbows on their marks. He then completes the position, aims at his target, and squeezes off the first round.

c. Taking the Sitting Position Rapidly.

- (1) The firer first assumes a correct sitting position, taking his time, and checks to see that he is aiming naturally at his target. The coach also checks the position to see that it is correct. The firer drops the rifle from his shoulder and marks his position on the ground by drawing a "U" inside his crotch. He then rises, keeping his feet in place, and stands in the ready position. On command, he sits down, breaking the fall with his right hand. He slides his buttocks back until they fit into the "U"

mark. He then completes the position, aims at the target, and squeezes off the first round.

- (2) When using the cross-legged sitting position, the firer stands with his feet crossed and, on command, sits down. When using the cross-ankled sitting position, he marks the position of his heels, then draws his legs close to his body and stands with his feet crossed. On command, he sits down and extends his legs until his heels rest on their marks.

d. Commands. The instructor conducts the exercise with the following commands. (He may use a preliminary command such as ALL FIRERS RISE, KEEPING YOUR FEET IN PLACE.)

LOCK, ONE ROUND, SIMULATE LOAD
READY ON THE RIGHT
READY ON THE LEFT
READY ON THE FIRING LINE
TARGETS UP
CEASE FIRING

At the command, LOCK, ONE ROUND, SIMULATE LOAD, the firer locks the rifle, simulates loading, and closes the bolt. The coach takes two steps to the rear to indicate to the instructor that the firer is ready. (It is also a safety precaution during range firing.) At the command, READY ON THE FIRING LINE, the firer unlocks his rifle with his right thumb. At the command, TARGETS UP, he assumes his position, aims at the target, and squeezes off the round. CEASE FIRING is commanded 10 seconds after TARGETS UP. The exercise is repeated until

all the men have performed it satisfactorily as firers.

63. Second Rapid Fire Exercise (Reloading)

a. The second rapid fire exercise consists of the procedure for reloading quickly and smoothly. It requires the soldier to take a clip of rounds from a pocket of the cartridge belt, load it into the rifle, reassume his position, and fire one round. Ten seconds are allowed for the exercise.

b. Before starting the exercise, the firer places a clip of dummy rounds in a pocket on the right side of his cartridge belt. He then assumes the position required (prone or sitting) and checks to see that he is aiming naturally at his target. The coach also checks the position to see that it is correct.

c. The exercise is executed at the following commands:

**FIRER IN POSITION
AIM AT YOUR TARGET
BOLT TO THE REAR
RELOADING EXERCISE
RELOAD
CEASE FIRING**

At the command, **RELOAD**, the firer drops the butt of his rifle from his shoulder and lets it rest on the ground. He reaches back with his right hand, takes the clip from his cartridge belt, and places it on top of the follower. He then balls his right hand into a fist with the thumb extended and places the thumb on the center of the top round as shown in figure 75. With his right elbow held high, he forces the clip into the receiver and

removes his hand smartly to the right front. If the bolt does not go forward, he should strike the operating rod handle sharply toward the muzzle. He then readjusts his position, aims at the target, and squeezes off the first round. The command, CEASE FIRING, is given 10 seconds after the first command.

d. The exercise is conducted in the same manner for both the prone and sitting positions. When using alternate sitting positions, the butt of the rifle is placed on the right thigh to reload, rather than on the ground. The exercise is repeated until all men are proficient in reloading in both positions.



Figure 75. Reloading in the prone position.

64. Third Rapid Fire Exercise (Cadence)

a. The third rapid fire exercise teaches how to fire the last seven rounds in a definite cadence or rhythm. This cadence is important both for accuracy and timing. Accurate shooting is never sacrificed for speed, so the men should not be

hurried at first. They should develop a smooth cadence of 5 or 6 seconds for the 7 rounds, then speed it up to the ideal cadence of 4 seconds. Developing a good cadence depends largely on a good position and correct trigger squeeze. If the firer has a good position, the sights will return to the aiming point after each shot. He should not remove his finger from the trigger after squeezing off each shot. It is only necessary to allow the trigger to move forward far enough for the trigger lugs to reengage the hammer hooks.

b. This exercise is conducted in the prone and sitting positions. The firer prepares for it by assuming the proper position and checking to see that he is aiming naturally at his target. The coach also checks the position to see that it is correct, then assumes the coaching position, holding his right hand a few inches in front of the operating rod handle (fig. 76). In this position, he can strike the operating rod handle to the rear, simulating the recoil of the rifle and cocking the hammer. A clip with a grooved wood block (fig. 77) is loaded into the rifle so that the bolt will not be held to the rear when the coach strikes the operating rod handle. The following commands are given for the exercise:

FIRER IN POSITION, AIM AT YOUR
TARGET
BOLT FORWARD, HAMMER DOWN
BOLT

The command BOLT is given seven times at the desired cadence (5 or 6 seconds initially, then 4 seconds). Each time the command BOLT is



Figure 76. Coach's position for the third rapid fire exercise.

given, the coach strikes the operating rod handle sharply to the rear and the firer aims and squeezes off a round. If the firer fails to squeeze off a shot before the next command of BOLT is given, the coach skips a beat to let him pick up the cadence with the next shot. The firer calls out the num-

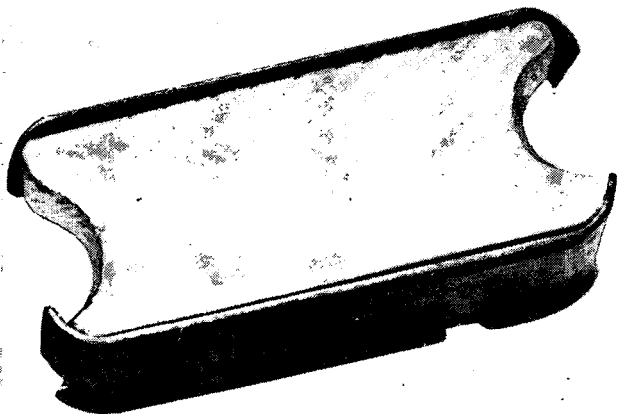


Figure 77. Clip fitted with a grooved wood block.

ber of each shot he fires, preceding each number by the letter "h," such as "hone," "htwo," "hthree." By doing this he expels the air in his lungs and has to breathe between shots. CEASE FIRING is given when the exercise is completed.

c. The exercise is conducted alike in the prone and sitting positions.

65. Fourth Rapid Fire Exercise

a. This exercise combines all the previous rapid fire exercises. The firer takes his position rapidly, simulates firing the first round, loads a clip of dummy rounds and simulates firing the eight rounds, all within 50 seconds. See the time breakdown in the rapid fire chart, paragraph 61c.

b. The firer prepares for the exercise by assuming a correct position and marking it. He then stands, keeping his feet in place. The coach then hands him a clip of dummy rounds which he places in his cartridge belt. He executes the exercise on the following commands:

LOCK, ONE ROUND, SIMULATE LOAD
READY ON THE RIGHT
READY ON THE LEFT
READY ON THE FIRING LINE
TARGETS UP
CEASE FIRING

At the command, LOCK, ONE ROUND, SIMULATE LOAD, the firer locks the rifle and simulates loading. The coach takes two steps to the rear to indicate that his firer is ready. At the command, READY ON THE FIRING LINE, the firer unlocks the rifle with his right thumb.

At the command, TARGETS UP, he assumes his position, fires the first round, reloads the clip of dummy rounds and fires the remaining rounds. Meanwhile, the coach moves up quickly, makes a mental note of any errors he observes in the firer's position, and assumes the proper coaching position. He strikes the operating rod handle to the rear each time the firer squeezes the trigger. He must be sure to force it all the way to the rear, or the dummy round will not be ejected and the bolt will not pick up a new round. The firer must concentrate on performing all movements deliberately and without hurrying. He must concentrate on accuracy; speed will come with practice. The command CEASE FIRING is given at the end of 50 seconds.

c. The exercise is conducted in the prone and sitting positions.

66. Fifth Rapid Fire Exercise

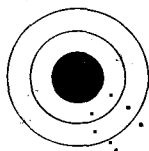
The fifth rapid fire exercise is conducted like the fourth one except that a clip with a grooved wooden block is loaded into the rifle before starting it. This means that the firer must simulate reloading, and he should take approximately 10 seconds to do so. The coach's commands and actions are the same as for the fourth exercise. The fifth exercise should be used only if dummy rounds are not available, since it does not give practice in reloading.

67. Shot Group Analysis

In firing a rapid fire exercise, the size, location, and shape of the shot group depends on several things: aiming, position, trigger squeeze, breath-

ing, and sight setting. The firer may be able to determine what errors he is making, if any, by examining his shot group on the target. This is called *shot group analysis*. Some of the common shot groups are analyzed in figure 78.

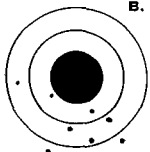
A. SHOTS SCATTERED LOW AND RIGHT.



CAUSE—FLINCHING OR JERKING THE TRIGGER. LEFT ELBOW SLIPPING OUTWARD, OR INCORRECT AIMING.

REMEDY—CHECK FOR EACH POSSIBLE CAUSE USING THE BALL AND DUMMY METHOD. VISUAL CHECK OF THE POSITION, AND THE M2 AIMING DEVICE. POINT OUT ERROR TO THE FIRER AND GIVE HIM CORRECTIVE INSTRUCTIONS.

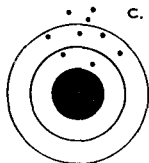
B. SHOTS SCATTERED LOW, RIGHT AND LEFT.



CAUSE—FLINCHING OR JERKING THE TRIGGER. UNSTEADY POSITION, OR INCORRECT AIMING.

REMEDY—SAME AS A.

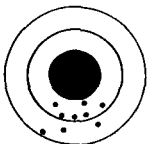
C. SHOTS FAIRLY WELL GROUPED BUT TOO HIGH (AFTER CORRECT ZERO HAS BEEN APPLIED).



CAUSE—ERROR IN AIMING: EITHER THE FRONT SIGHT IS ABOVE THE CENTER OF THE REAR SIGHT APERTURE OR THE FRONT SIGHT IS PLACED INTO THE BULL'S-EYE.

REMEDY—CHECK AIMING BY USING THE M2 AIMING DEVICE. POINT OUT ERROR NOTED AND GIVE CORRECTIVE INSTRUCTIONS.

D. SHOTS FAIRLY WELL GROUPED BUT TOO LOW (AFTER CORRECT ZERO HAS BEEN APPLIED).



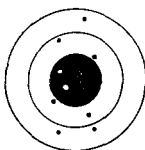
CAUSE—ERROR IN AIMING: EITHER THE FRONT SIGHT IS BELOW THE CENTER OF THE REAR SIGHT APERTURE OR THERE IS A LINE OF WHITE BETWEEN THE TOP OF THE FRONT SIGHT AND THE BULL'S-EYE.

REMEDY—SAME AS C.

① Shot group analysis

Figure 78.

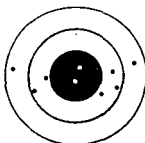
E. SHOTS SCATTERED VERTICALLY.



CAUSE—INCORRECT VERTICAL ALINEMENT OF SIGHT, IMPROPER BREATHING, OR A COMBINATION OF BOTH.

REMEDY—CHECK AIMING USING THE M2 AIMING DEVICE WHILE THE SOLDIER FIRES A SERIES OF DRY SHOTS. CHECK TO SEE THAT HE HOLDS BREATH FOR EACH SHOT. POINT OUT ERROR NOTED AND GIVE CORRECTIVE INSTRUCTIONS.

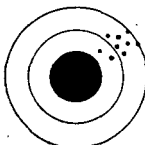
F. SHOTS SCATTERED HORIZONTALLY.



CAUSE—INCORRECT HORIZONTAL ALINEMENT OF SIGHT, UNSTEADY POSITION, OR A COMBINATION OF BOTH.

REMEDY—CHECK AIMING USING THE M2 AIMING DEVICE WHILE THE SOLDIER FIRES A SERIES OF DRY SHOTS. CHECK POSITION OF FIRER TO SEE IF IT IS STEADY. POINT OUT ERROR NOTED AND GIVE CORRECTIVE INSTRUCTIONS.

G. SHOTS WELL GROUPED BUT OUTSIDE BULL'S-EYE.



CAUSE—PROBABLY INCORRECT SIGHT SETTING SINCE THE SIGHT GROUP INDICATES THE FIRER IS AIMING CONSISTENTLY AND SQUEEZING THE TRIGGER PROPERLY.

REMEDY—CHECK AIMING USING THE M2 AIMING DEVICE TO DETERMINE IF THERE IS AN ERROR IN THE SIGHT PICTURE WHICH CAUSED THE POSITION OF THE GROUP. IF NOT, HAVE HIM MAKE A SIGHT CHANGE TO MOVE THE GROUP INTO THE BULL'S-EYE.

② Shot group analysis

Figure 78—Continued.

Section VI. SIGHT ADJUSTMENT, ZEROING, AND USE OF THE FIRING DATA CARD

68. General

a. The rear sight (fig. 79) can be adjusted to correct for a wind that is strong enough to blow a bullet off its course, or simply to change the strike of the bullet to another spot on the target. The strike of the bullet can be made higher or

lower (called elevation) or can be moved to the right or left (called windage). The elevation and windage knobs make audible clicks when they are turned. Each of these clicks changes the strike of the bullet to a definite degree (pars. 70 and 71). The elevation can be adjusted from 0 to 72 clicks. The windage can be adjusted 16 clicks to the right and left of the center index line.

b. Before a rifleman can use the rear sight properly, he must know how to estimate wind strength and how to counteract it with a windage adjustment; and he must learn how to figure other sight changes as necessary.

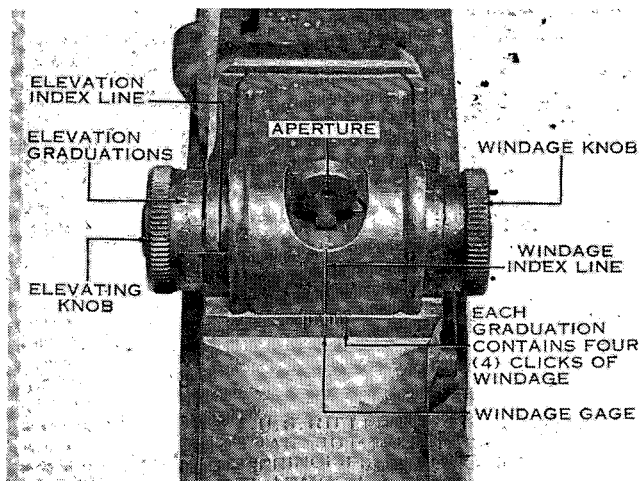


Figure 79. The rear sight.

69. Effect of the Wind

a. *General.* Wind is the only weather condition that affects the flight of a bullet enough to

make it an important factor in good shooting. When considering the effect of the wind and adjusting for it on the rear sight, the rifleman must know or be able to estimate three things. They are wind direction and velocity and the range to the target.

b. Wind Direction and Classification. The direction of the wind can be determined by observing its effect on the range flag or on small trees or bushes, or by feeling it on the face. The clock system is used to state the direction of the wind. The firer imagines he is in the center of a large clock (fig. 80). His target is at 12 o'clock and 6 o'clock is directly to his rear. A wind blowing from his right is called a 3 o'clock wind; a wind from his left, a 9 o'clock wind; and so on around the clock. The direction of the wind, as well as its speed, determines how far the bullet is blown off its course as it travels to the target. For example, a wind blowing from 3 o'clock has much more effect on the bullet than a wind of the same strength from 1 o'clock. For this reason winds are classified as *full value*, *half value*, and *no value winds*. Notice in figure 81 that winds from 2, 3, and 4 o'clock and 8, 9, and 10 o'clock are shown as full value winds since they have the maximum drifting effect on the bullet. Winds from 1, 5, 7, and 11 o'clock are classed as half value winds since they have less drifting effect on the bullet. Winds from 12 o'clock and 6 o'clock may slow down or speed up the bullet, but since this effect is so slight, they are classified as no value winds.

c. Wind Velocity. The second variable to be considered is the velocity of the wind measured

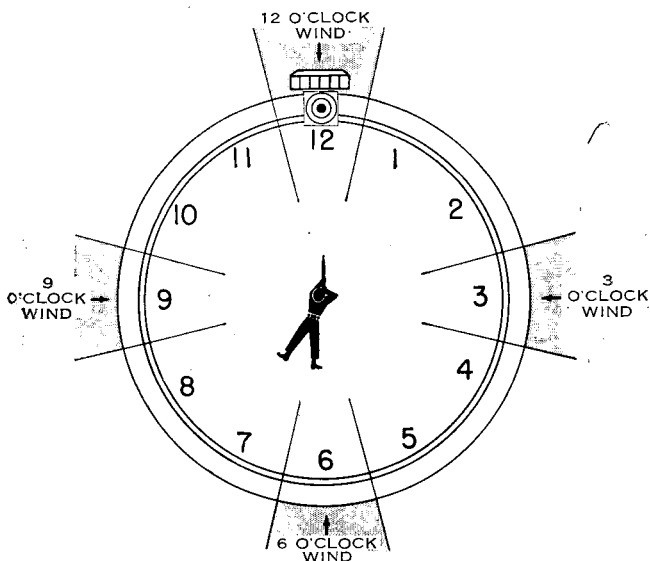


Figure 80. The clock system for stating wind direction.

in miles per hour. There are three ways to estimate the velocity of the wind.

- (1) *First method.* The position of the range flag indicates wind strength. When a wind is blowing, the flag forms an angle with its pole. To determine wind velocity in miles per hour, estimate the angle in degrees between the flag and the pole, and divide the angle by four. The answer is the approximate wind velocity in miles per hour. An example of this method is illustrated in figure 82. The firer must learn to express wind velocity in miles per hour so that he can always use this figure to determine how many

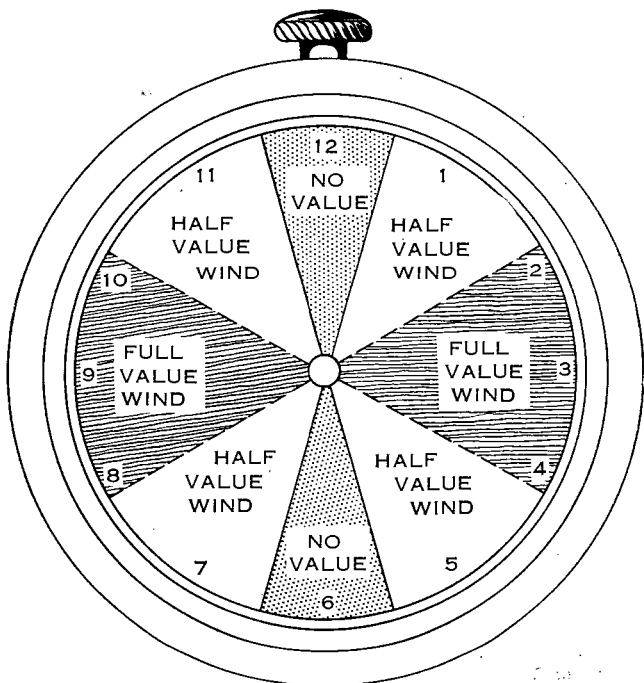
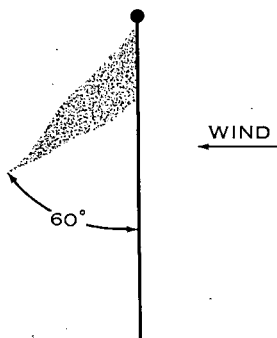


Figure 81. Classification of winds.

clicks to place on the rear sight to compensate for it (par. 70).

- (2) *Second method.* In the field without a range flag, the firer may use a similar system by dropping bits of paper, leaves, or dry grass from the shoulder and pointing to the place they land. The angle formed by the arm with the body, like the angle formed by the range flag and pole, can be used to estimate the velocity of the wind.



THE WIND IS BLOWING THE FLAG
OUT AT AN ANGLE OF 60°.

ANGLE IS 60°

$60 \div 4 = 15$ MILES PER HOUR

Figure 82. Estimating wind velocity.

(3) *Third method.* In the field or in combat, the velocity of the wind can be estimated by observing its effect on natural objects as follows:

- (a) Under 3 m. p. h., wind can hardly be felt. (Only smoke drift will show it.)
- (b) A 3-5 m. p. h. wind can be felt on the face.
- (c) At 5-8 m. p. h. leaves are in constant motion.
- (d) At 8-12 m. p. h. the wind raises dust and loose paper.
- (e) At 12-15 m. p. h. small trees begin to sway.

d. Range. The third thing to be considered when determining the effect of the wind is the

range to the target. The farther a bullet travels, the longer it is exposed to the effect of the wind, and the longer it is exposed to the wind, the farther it drifts from its course. For this reason, more windage must be put on the rear sight to compensate for wind drift at long ranges than at short ones. During known-distance firing, the range to the target is given. In the field or in combat, the firer must estimate the range (par. 142). Range is always expressed in 100-yard units to compute the effect of the wind.

70. Wind Formula

a. When the firer has learned to determine wind direction and strength, and the range to a target, he can use this information to make corrections on the rear sight by using *wind formula*. In the formula shown below—

R equals the range to the target expressed in hundreds of yards.

V equals the velocity of the wind in miles per hour.

15 is a constant figure.

WIND FORMULA

$$\frac{R \times V}{15} = \text{number of clicks for a full value wind (for half value winds, divide the result by 2).}$$

b. To illustrate how the wind formula is used, assume that a rifleman is firing at a range of 300 yards in a wind that he estimates at 15 miles per hour. Here is the way he would use the wind formula to find the number of clicks to correct for the wind:

$$\begin{array}{l}
 R=3 \\
 V=15 \\
 \frac{R \times V}{15} = \frac{3 \times 15}{15} = 3 \text{ clicks for a full value} \\
 \text{wind.}
 \end{array}$$

If there is a fraction in the answer when using the wind formula, the lower whole number is used (example: $5\frac{1}{2}$ would be 5). This is necessary because half clicks cannot be placed on the rear sight.

c. After the rifleman learns how to figure the number of clicks to correct for the wind, he must learn how to properly place these clicks on the rear sight. To do this he must remember this rule: *move the rear sight into the wind*. In other words, if the wind is blowing from 3 o'clock, he would place right windage on the rear sight by turning the windage knob forward the required number of clicks. If the wind is blowing from 9 o'clock, he would place left windage on the sight by turning the windage knob backward the required number of clicks. The wind formula is used for the first shot or shot group only.

71. Elevation and Windage Rule

a. After the firer compensates for wind drift by applying the wind formula, he makes additional sight changes to move the strike of the bullet into the center of the bull's-eye by applying the elevation and windage rule. This rule is: *one click of either elevation or windage moves the strike of the bullet approximately one inch on the target for every 100 yards of range* (fig. 83). For example, 2 clicks of either elevation or windage will

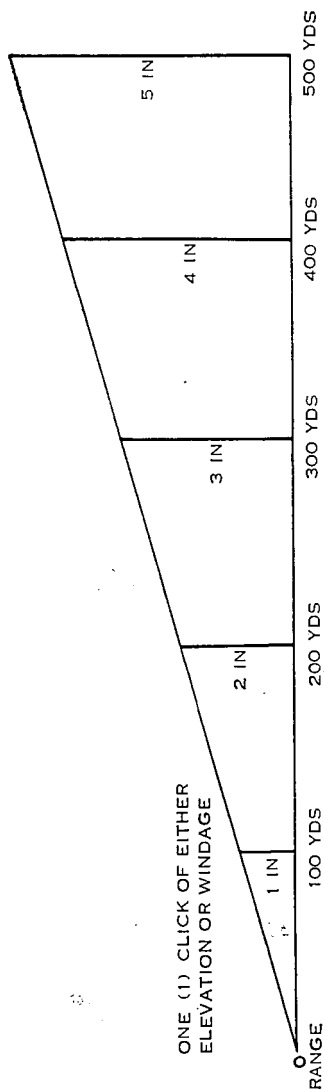


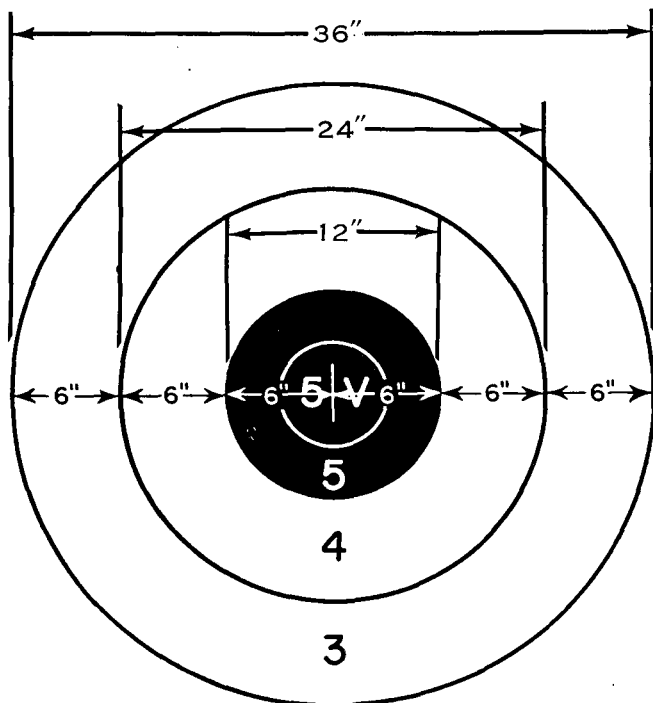
Figure 83. The elevation and windage rule.

move the strike of the bullet approximately 4 inches on the target at a range of 200 yards.

b. When firing at a range of 1,000 inches, this rule is used: *one click of either elevation or windage moves the strike of the bullet on the target approximately one-fourth of an inch.*

72. Target Dimensions

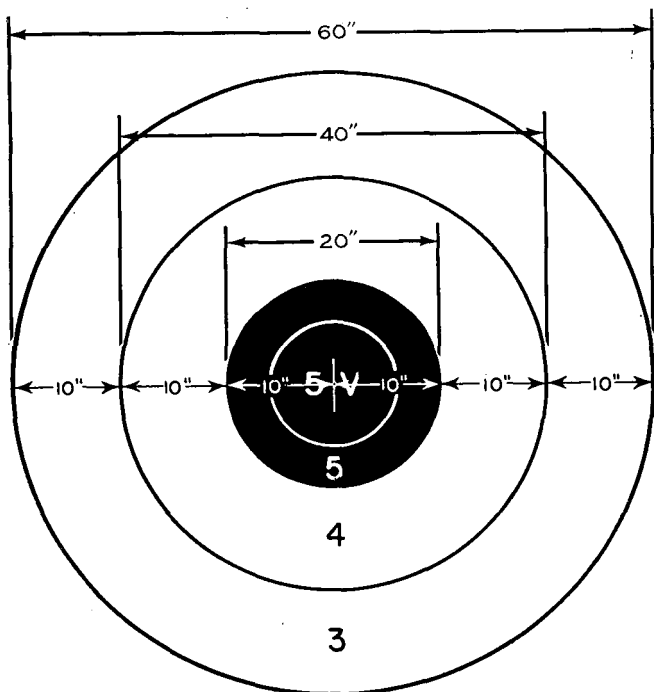
To be able to use the elevation and windage rule intelligently, the firer must be familiar with the dimensions of the various targets (fig. 84).



① The A target

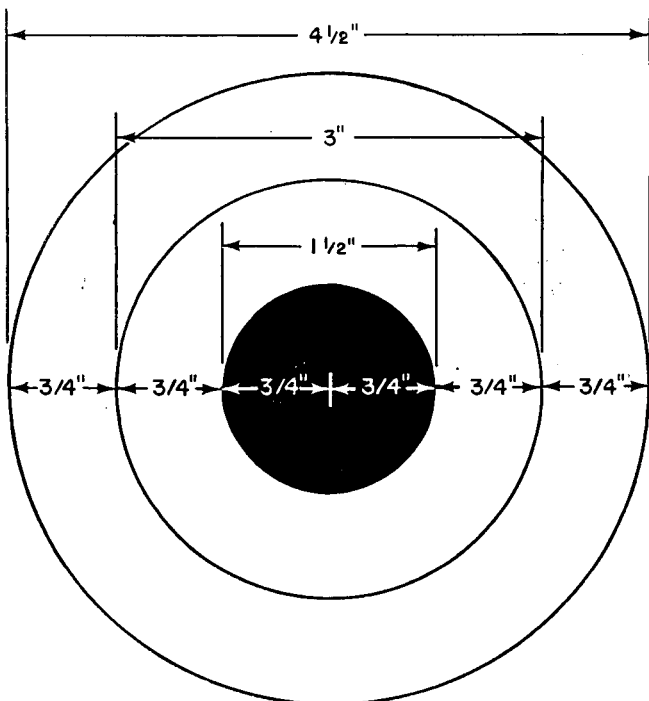
Figure 84.

The A target is used for both slow and sustained fire at ranges of 100, 200, and 300 yards. The B target is used for slow fire at 500 yards. Notice that on each target there is a constant figure from the center of the bull's-eye to the edge and to each succeeding ring. This makes it easier to remember the dimensions. For the 1,000-inch target this figure is three-fourths of an inch; for the A target it is six inches, and for the B target it is 10 inches.



② The B target

Figure 84—Continued.



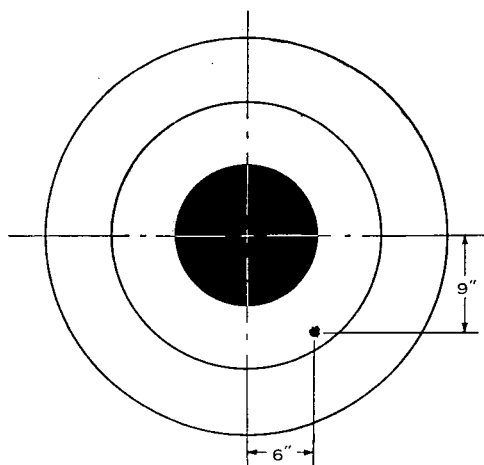
③ The 1,000-inch target

Figure 84—Continued.

73. Sight Changes

a. Knowing the elevation and windage rule and the dimensions of the target, the firer can make sight changes to move the strike of the bullet into the center of the bull's eye. Look at figure 85. Notice that the distance to be moved in elevation is estimated straight up or down as the case may be. The windage must be estimated straight across the target to the right or left. These dis-

tances are then converted to clicks by using the elevation and windage rule. Again refer to figure 85 and notice how the number of clicks are determined to move the strike of the bullet into the center of the bull's-eye.



SHOT IS 9 INCHES LOW AND 6 INCHES TO THE RIGHT.
FIRING CONDUCTED AT 300 YARDS (1 CLICK WILL MOVE THE
STRIKE OF THE BULLET APPROXIMATELY 3 INCHES)

9 INCHES = 3 CLICKS

6 INCHES = 2 CLICKS

SIGHT CHANGE NECESSARY—2 CLICKS LEFT, 3 CLICKS UP

Figure 85. Example of computing a sight change.

b. Changes in rear sight setting affect the strike of a bullet in a definite way: an increase in elevation raises the strike of the bullet, a decrease lowers it; right windage moves the strike of the bullet to the right, and left windage moves it to the left.

74. Effect of Light

Varying degrees of light (bright, dull, or hazy) do not affect the flight of the bullet, but they do affect a man's aim. Some men tend to shoot low on bright days and high on dull days, while others are affected the opposite way. If the rifleman has a wandering zero from day to day, a check of his firing data card can be made to determine if a trend up or down is related to light. It is best for the beginner to disregard any sight corrections for light until he has fired enough to have some definite evidence of how various degrees of light affect him. When he has learned this, he can make sight corrections accordingly, based on the size of the error caused on the target.

75. Zeroing

a. Explanation. Every rifle has certain characteristics that make it fire a little high or a little low, or a little to the right or left. To be able to get consistent hits, each rifleman must know which of these characteristics his rifle has and correct them by setting up a particular setting on the rear sight. The procedure for finding this sight setting is called zeroing. The following zeroing procedures should be conducted under the supervision of the coach.

b. Zeroing When No Wind Is Blowing. Place the center index line on the rear sight on the center mark of the windage gage. Set the average elevation for whatever range is being used (12 clicks for 200 yards). Fire one shot from the sandbag rest position, calling the shot and plotting the call on the firing data card. Note where the

shot appears on the target and plot its location on the firing data card. If, in the opinion of the coach, the firer called his shot correctly, he may have the firer make the necessary sight change to move the next shot into the bull's eye. If he is in doubt as to the firer's performance or if the call was incorrect, the coach should require the firer to fire one or more confirming shots before having him make a sight change. If the firer fails to perform similarly for several shots, or if he cannot call his shots, there is no point in making sight changes. He should be given more practice in trigger squeeze. This procedure is continued until the coach is satisfied that the firer has zeroed his rifle. The sight setting that produces several shots in the center of the bull is the rifle's zero for the range being fired. Rifles should be zeroed at 100, 200, 300, and 500 yards.

c. Zeroing When a Wind Is Blowing. To zero when a wind is blowing, the rifleman must first correct for the effect of the wind with a windage setting by applying the wind formula (par. 71). He then fires for zero as explained in *b* above. When he gets several shots centered in the bull as plotted on his firing data card, he notes the sight setting and subtracts from it the deflection he first put on the sight to account for the wind. This gives him the zero sight setting.

d. Recording the Zero. The zeroing procedure should be recorded on the firing data card. See paragraph 76c.

76. Use of the Firing Data Card

a. General. During all range firing, riflemen are required to maintain an accurate record of

their firing on DA Form 83 (Firing Data Card) (fig. 86). If he keeps this card properly, he or the instructor or coach can analyze his firing and determine the progress he is making. A study of the card will show whether or not errors are made in computing for the effect of the wind and if the zero for each range is correct. By comparing the *call target* with the *hit target*, he can determine how consistent he is in aiming, squeezing the trigger, following through, and calling his shots. When the firing data card is carefully and uniformly maintained, it is a valuable aid in learning to shoot the rifle accurately. It should be kept as neatly as possible. Entries should be made with a pencil, because ink smears and becomes illegible if the card gets damp.

b. Preliminary Information. When a rifleman receives his card, he should fill in the personal information called for on the front: name, rank, serial number, etc. He should write his rifle number in the space provided. Notice the recording block in figure 87. This shows what information should be placed on the card just before firing. It includes the range and position; the weather and light, described in the firer's own words (for example, cold, rainy, or clear; bright, dull, or hazy); the direction of the wind, indicated by an arrow drawn through the clock, showing the direction from which the wind is blowing; the velocity of the wind in miles per hour and the computation needed to correct for it (if there is no wind or if the wind is of no value, the computation space should be checked to indicate that it has been considered); and the initial sight setting in

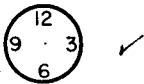
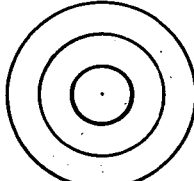
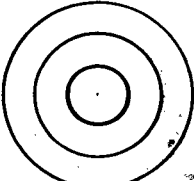
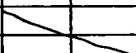
RANGE 100			HOUR 0800		COMPUTATION RV 15	
POSITION STANDING			DATE 25 FEB 57			
			WEATHER CLEAR			
NO.	EL	WIND	LIGHT BRIGHT		WIND VELOCITY	
1	14	0				
2						
3						
4						
5						
6						
7						
8						
			USE NUMBERS TO DESIGNATE LOCATION			
9			ZERO ELEV		ZERO WIND	
10			TOTAL SCORE			

Figure 87. A block of the firing data card with information entered before firing.

elevation and windage, entered opposite the first round. (In this case, eight rounds are to be fired, so the spaces for the ninth and tenth rounds are crossed out.)

c. *Recording the Zero.* Figure 88 shows a block of the firing data card filled out for zeroing (par. 75d). Notice that all the procedure including the computation for the wind is entered. The initial sight setting is entered opposite the first shot. After each shot is fired, the firer plots his call by placing the number of the shot on the call target. The target is marked after the first shot has been fired and the exact location of the shot is plotted on the hit target, using the corresponding number. Follow the rest of this explanation on figure 88. Notice the location of hit number 1 in relation to the call. This would indicate to a

coach that the firer is not calling his shot correctly or that his weapon is not zeroed. In such a case, the coach would have his man fire a confirming round to obtain a grouping of two shots upon which a sight change can be based. The grouping of shots 1 and 2 indicate the firer's ability to call correctly, so the coach would have him make a sight change to move his third shot to the center of the bull's-eye. The firer calls shot number 3 and plots the hit. It is not center bull, but as the firer calls it correctly, the coach has him make another sight change to bring the next shot into the center of the bull. Notice that the call for shot number 4 is plotted in a corner of the call target with a question mark beside it. This indicates that the firer flinched on the shot and could not call it. Since he flinched, the firer disregards the shot and fires again. Shot number 5 is in the center of the bull, but it takes at least two shots in the center of the bull, correctly called, for the firer to decide what his zero is. So the firer makes shot number 6, calls it properly, and plots it. Since he called shots 5 and 6 correctly and they are grouped in the center of the bull's-eye, he uses the sight setting with which he made them to obtain his zero. The last sight setting was 14 clicks elevation and 6 clicks right windage. Since 2 clicks of right windage were placed on the rear sight to correct for the wind, the firer takes them off to arrive at the true zero: 14 clicks elevation and 4 clicks right windage. He enters this setting in the space provided on the firing data card.

Note. It may take more or fewer rounds to zero a rifle.

d. *Recording Slow Fire.* The upper left recording block of figure 86 shows an example of how the firing data card is kept for slow fire. The sight setting in elevation and windage is entered just before each round is fired. After firing each round, the firer plots his call by entering the number of that shot on the call target at the location he thought it should strike. When the target is marked, he plots the exact location of the shot on the hit target using the corresponding number. When all the shots have been fired, he totals the score from the hit target, and enters it in the space provided. He also enters his zero for that range in the space provided.

e. *Recording Rapid Fire.* The center recording block in the first column of figure 86 ① shows

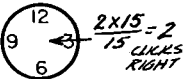
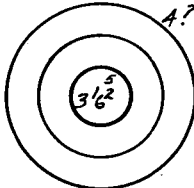
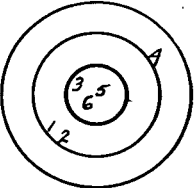
RANGE 200			HOUR 0900		COMPUTATION $\frac{RV}{15}$	
POSITION PRONE ZERO			DATE 25 FEB 57			
			WEATHER CLEAR			
NO.	EL	WIND	LIGHT BRIGHT		WIND VELOCITY 15 MPH	
1	12	2R	CALL TARGET 		HIT TARGET 	
2	12	2R				
3	15	6R				
4	14	6R				
5	14	6R				
6	14	6R				
7						
8						
			USE NUMBERS TO DESIGNATE LOCATION			
9			ZERO ELEV	ZERO WIND	TOTAL SCORE	
10			14	4R	—	

Figure 88. A block of the firing data card filled in for zeroing.

an example of how the firing data card is kept for rapid fire. The sight setting is recorded only once because all rounds are fired with the same setting. After the exercise has been fired, the firer indicates where he thinks his group should be by drawing a circle on the call target. When the target is marked, he plots each shot on the hit target with penciled dots. He then totals his score from the hit target and enters it in the appropriate space on the firing data card.

f. Zero Record Card. The zero record card is shown in figure 86 ①. When the firer has zeroed his rifle for all ranges, he enters the sight settings in elevation and windage for each range on this card. He then tears off the card at the perforation and pastes, glues, or shellacs it to the floor plate of the trigger housing group. This gives the firer a ready reference to the zero sight settings for each range.

Section VII. EXAMINATION BEFORE RANGE FIRING

77. General

Riflemen should be examined before they fire on the known-distance range to see if they show any deficiencies in their preparatory marksmanship training. The examination must be given far enough in advance so that additional training may be scheduled to correct the deficiencies noted. The examination may be conducted concurrently with training as oral or written questions and answers, or it may be given immediately after completing training as a single, performance-type test.

78. Types of Examinations

a. If the examination is conducted concurrently with training, the assistant instructors should have as few men as possible to personally supervise so that they can adequately examine each one. The assistant instructors must keep a progress record on each man, recording his deficiencies and checking to see if they are corrected as the training progresses. Each firer is required to keep the targets he uses on the 1,000-inch range. Each target should be marked with the firer's name, the position he used, the type of firing, and the date. The assistant instructors should closely examine these targets to determine the weaknesses, if any, in aiming, positions, trigger squeeze, and rapid fire. On the basis of their findings, they recommend additional training for the men who need it. The additional training is scheduled after preparatory marksmanship training has been completed.

b. The performance type examination is commonly called a "county fair." It is divided into a number of stations, and the men, in groups, move from station to station to be tested. The organization for the county fair is shown in figure 89. A minimum number of assistant instructors can test a large number of men by the county fair method. To conduct the examination, a company or similar unit is broken down into groups, one for each station. Each group is sent to a station and the test begins. On the instructor's command, the groups move in a clockwise direction to the next testing station.

The procedure is repeated until each group has been tested at each station. A sample grading sheet is shown in figure 90. (DA Form 2120-R which will be reproduced locally on 8 x 5¼ inch paper.) The assistant instructors grade each man individually as he performs the various exercises. Examples of how the examination may be conducted at each station are discussed below:

- (1) *Station No. 1, aiming.* The assistant instructor may use an aiming bar, M15 sighting device, or the setup for the third aiming exercise. Each man is required to demonstrate his ability to set up correct sight alinement and sight picture or to make a satisfactory shot group by performing the third aiming exercise.
- (2) *Stations No. 2-6, positions.* The men demonstrate their ability to assume the various positions correctly and to properly adjust the sling.
- (3) *Station No. 7, trigger squeeze.* The men demonstrate their ability to properly squeeze the trigger, using one of the methods described in paragraph 60.
- (4) *Station No. 8, rapid fire.* The men perform one of the rapid fire exercises and the assistant instructor grades them on correct procedure and timing.
- (5) *Station No. 9, sight adjustment.* The men make a number of computations to move a shot group into the center of the bull's-eye. They are then required to place this sight adjustment on their rifles.

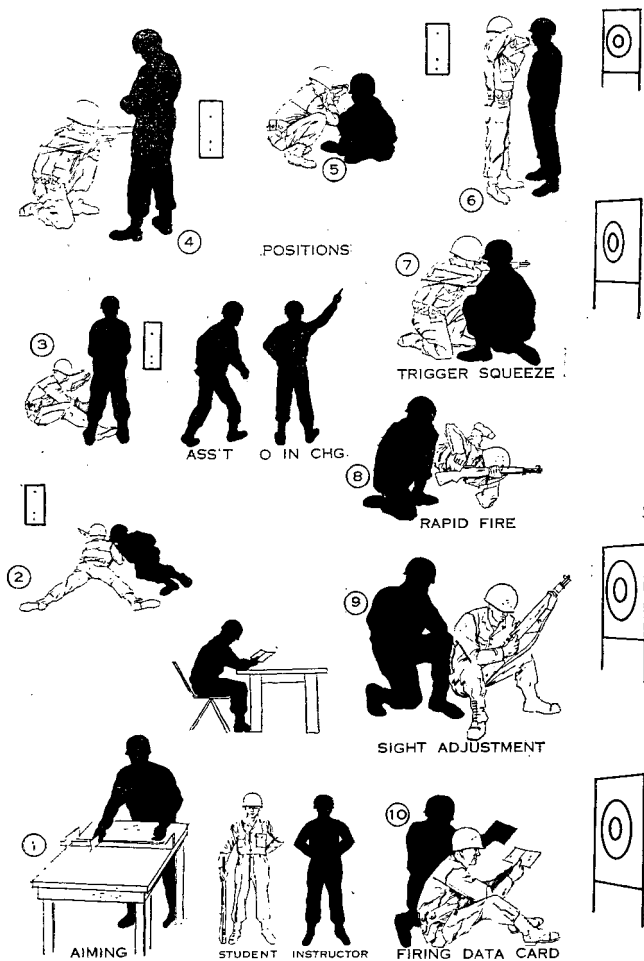


Figure 89. Organization for a performance type (county fair) examination.

GRADING SHEET - PERFORMANCE TYPE EXAMINATION				
NAME AND GRADE		DATE		
ORGANIZATION				
STATION	SATIS-FACTORY	UNSATIS-FACTORY	SCORER'S INITIALS	
No. 1: Aiming				
No. 2: Loop Sling and Prone Position				
No. 3: Sitting Position				
No. 4: Kneeling Position				
No. 5: Squatting Position				
No. 6: Hasty Sling and Standing Position				
No. 7: Trigger Squeeze				
No. 8: Rapid Fire				
No. 9: Sight Adjustment				
No. 10: Firing Data Card				
Indicate grade by marking appropriate block.				

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Figure 90. Grading sheet for a performance type (county fair) examination.

- (6) *Station No. 10, firing data card.* The men fill out a block of the DA Form 83 firing data card based on information the instructor gives them. They may also be required to determine the zero of a rifle by using the information filled in the block of the firing data card.

CHAPTER 4

MARKSMANSHIP TRAINING—PHASE I, KNOWN-DISTANCE FIRING

Section I. PURPOSE AND SCOPE

79. Purpose of Known-Distance Firing

Known-distance firing gives the rifleman an opportunity to apply all the principles learned during preparatory marksmanship training. He learns to zero his rifle for all usable ranges and to make practical application of sight adjustments. This phase of training gives him confidence in his rifle and himself. The precision required makes him realize that shooting is an exact art and that he must apply himself diligently to become an effective rifleman.

80. Types of Firing

a. Known-distance firing consists of instruction firing on the 1,000-inch range and both instruction and record firing on the known-distance range. Instruction firing is practice firing with the assistance of instructor personnel and coaches. Record firing is done without the assistance of instructors or coaches, and is used to determine the rifleman's qualification.

b. As a general rule, instruction firing is completed before any portion of record firing is

started. No part of record firing should be conducted on the same day with instruction firing unless scheduling difficulties require it. If at all possible, record firing should be completed in one day.

81. Courses

a. General. The different types of firing courses are described below and in the firing tables in appendix II. They are established to provide standardized rifle training throughout the Army and to provide an adequate means of testing the capabilities of riflemen.

b. Combat Qualification Course. This course is designed to fully qualify the soldier as a combat rifleman by requiring him to complete all phases of individual rifle marksmanship training. His qualification is determined by his known-distance score, but he is required to confirm this qualification by satisfying a minimum requirement in combat firing (ch. 5) and night firing (ch. 6). This course is fired annually for qualification by all men armed with the M1 rifle, regardless of their prior qualification. It is the only course for which a qualification classification may be awarded.

c. Proficiency Course. This course is intended for the use of National Guard, Reserve, and other units not having the time or facilities to fire the combat qualification course. It is designed to test the soldier on the fundamentals of shooting without particular regard to the special requirements of using the rifle in combat. This course is fired annually by the units that use it in lieu

of the combat qualification course and may be fired to satisfy the annual rifle familiarization requirements. A proficiency rating is awarded for this course rather than a qualification classification.

d. Familiarization Course: This course is designed to acquaint the individual with firing the rifle. It is used only when combat qualification and proficiency course firing are not authorized.

Section II. 1,000-INCH RANGE FIRING

82. Advantages and Use of the 1,000-Inch Range

a. The 1,000-inch range is easy to set up and use. It requires very little space compared with other type ranges and an impact area is not needed if a suitable embankment is built behind the targets. Valuable training can be given on the 1,000-inch range if close supervision and personal instruction are used. The riflemen can conveniently examine each of their targets after they fire on it to determine what errors or progress they are making.

b. The 1,000-inch range is used for preparatory marksmanship training and initial instruction firing of the combat qualification course. It may be used for the proficiency and familiarization courses. During preparatory marksmanship training and instruction firing, the ball and dummy method should be used to the maximum (par. 60).

83. Organization for Firing

A typical organization for a 1,000-inch range is shown in figure 91. To make maximum use of

training time, there should be one firing point for each two men undergoing training. The control officer is centrally located about 15 yards back of the firing line. It is best for him to have a tower so that he can observe the entire firing line. A platoon leader or other officer can supervise about 25 firing points. Trained coaches are used to give individual instruction as indicated in paragraph 38a. One ammunition table for each 10 firing points and ammunition in covered boxes are placed about 10 yards back of the firing line. Rifle rests are placed 20 yards back of the firing line. Targets are pasted or otherwise fastened to target panels which hold a maximum of 12 targets, permitting six targets to be used by each firer without replacement. If all firing orders cannot be actively engaged simul-

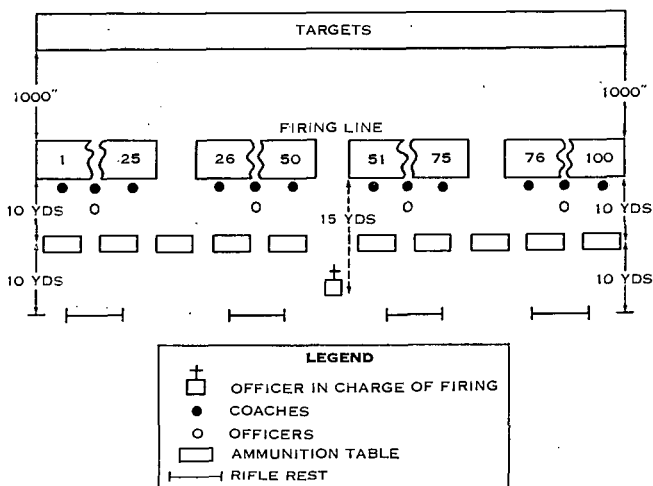


Figure 91. Organization of a 1,000-inch range.

taneously either in instruction on the line or in preparation for instruction, concurrent training in the elements of marksmanship may be conducted to keep all the men advantageously occupied.

84. Conduct of Firing

a. Commands for the conduct of firing should be standardized and kept to a minimum to help simplify procedures. The following commands are used:

- (1) Slow fire (A preliminary command to describe the exercise may be used. Example: "The next firing will consist of eight rounds slow fire from the standing position.") :

FIRERS ASSUME THE _____
POSITION
COACHES PICK UP _____
ROUNDS OF AMMUNITION
LOCK, ONE ROUND, LOAD
C O M M E N C E F I R I N G W H E N
READY
CEASE FIRING
CLEAR ON THE RIGHT?
CLEAR ON THE LEFT?
THE FIRING LINE IS CLEAR
COACHES AND FIRERS MOVE
DOWNRANGE AND EXAMINE
TARGETS

- (2) Rapid fire (A preliminary command to describe the exercise may be used. Example: "The next firing will be a 50-

second rapid fire exercise from the sitting position.”) :

FIRERS ASSUME THE _____
POSITION
RISE, KEEPING YOUR FEET IN
PLACE
COACHES PICK UP 1 CLIP OF
8 ROUNDS AND 1 LOOSE
ROUND
LOCK, ONE ROUND, LOAD
READY ON THE RIGHT?
READY ON THE LEFT?
READY ON THE FIRING LINE
TARGETS UP
CEASE FIRING
CLEAR ON THE RIGHT?
CLEAR ON THE LEFT?
THE FIRING LINE IS CLEAR
COACHES AND FIRERS MOVE
DOWNRANGE AND EXAMINE
TARGETS

b. During the conduct of firing, the officers and noncommissioned officers along the line work closely with the control officer to relay commands when necessary, enforce safety regulations, and give certain signals as required. The following signals may be used to expedite procedure:

- (1) **READY** or **CLEAR**—the man who gives the signal faces the tower and extends his arm up and to his front with the palm of his hand toward the control officer.
- (2) **NOT READY** or **NOT CLEAR**—the man who gives the signal faces the tower

and extends both arms over his head with his hands clasped.

85. Zeroing on the 1,000-Inch Range

a. The rifle is zeroed for the 1,000-inch range as described in paragraph 75. The zero obtained will correspond closely to the zero for 200 yards.

b. If necessary, the 1,000-inch range may be used to determine the battle sight zero. Using either a 1,000-inch target or a black paster for an aiming point, follows this procedure:

- (1) Fire for zeroing as described in paragraph 75 until a shot group of at least two shots is centered approximately $1\frac{1}{4}$ inches above the point of aim or just below the top edge of the bull's-eye (fig. 92).
- (2) The resulting sight setting is the battle sight. Calibrate it on the rear sight as described in paragraph 97.
- (3) This sight setting enables the soldier to hit his *point of aim* at a range of 300 yards.

Section III. KNOWN-DISTANCE INSTRUCTION FIRING

86. Organization for Firing

a. A known-distance range must be thoroughly organized to insure efficient operation. It may be said that an orderly range is also a safe range. A suggested organization for known-distance instruction firing is shown in figure 93. It may be modified to fit local range facilities and the number of men undergoing training. A seventy-point known-distance range can adequately handle

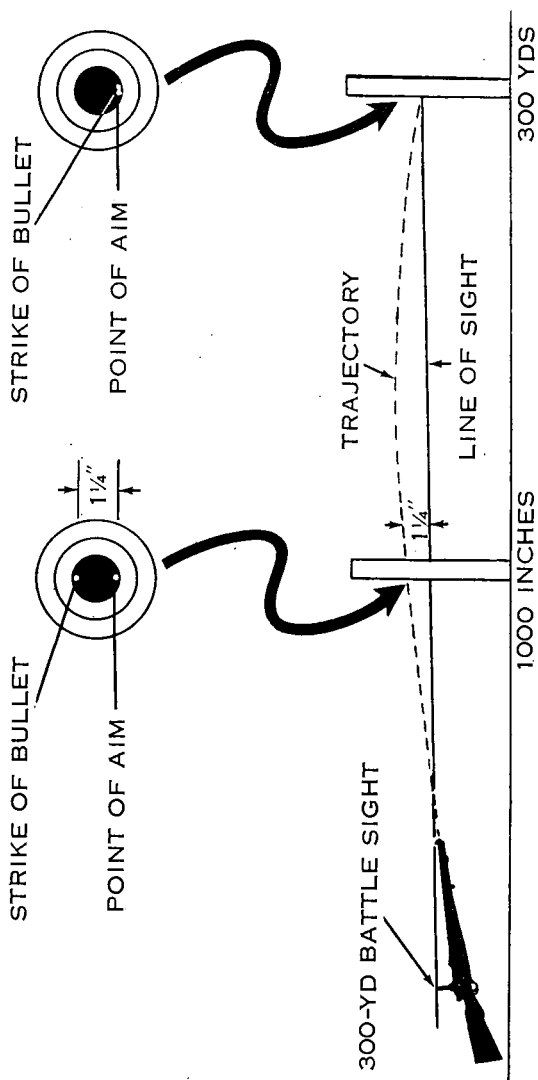


Figure 92. Battle sight zeroing on the 1,000-inch range.

a company of 200 men organized into three orders with another unit furnishing details. If it is necessary for a company to furnish its own details, a range with fifty firing points is adequate with the company organized into four orders. If it is necessary for a unit to use five or more orders, some type of concurrent training should be utilized to prevent long waiting periods. The normal waiting period for four orders or less is desirable to permit the firers to rest and prepare for the next exercise.

b. The following personnel are suggested for efficient operation of the range:

- (1) One control officer.
- (2) One officer in charge of pits.
- (3) One officer to supervise two blocks of eight firing points each.
- (4) Coaches as assigned.
- (5) One noncommissioned officer to supervise two blocks of eight targets each in the pits.
- (6) Two telephone operators for each block of eight targets (one on the firing line and one in the pits).
- (7) An ammunition detail as required.
- (8) Three target operators per two targets. (One operator per target can be used, but having an extra man per two targets will permit the operators to take breaks without interfering with the conduct of the firing.)

87. Conduct of Firing (General)

a. Commands for the conduct of firing should be kept to a minimum and should be standardized.

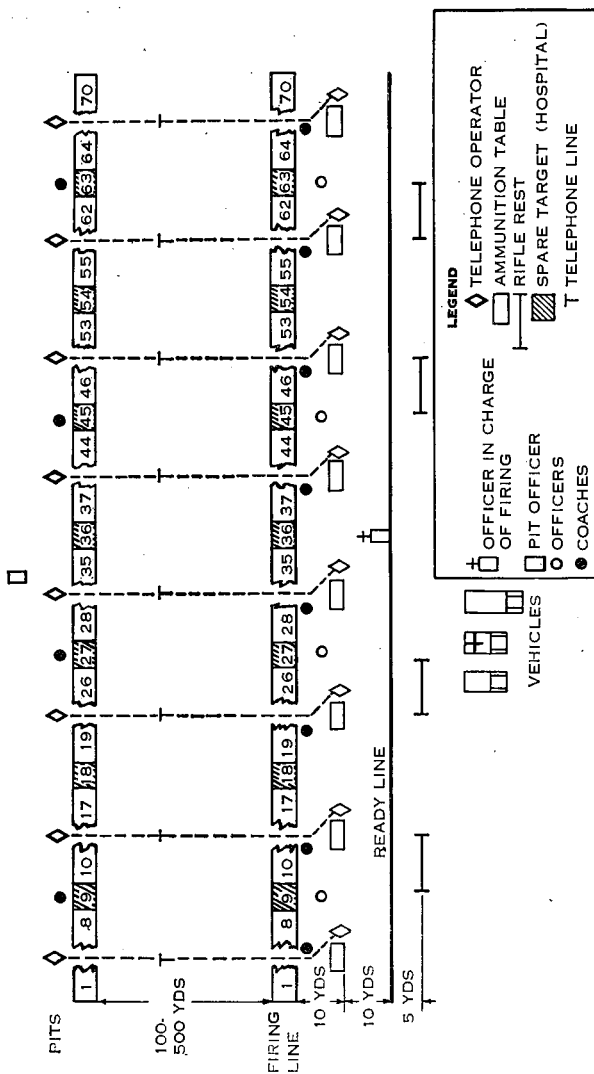


Figure 93. Organization of a known-distance range.

The proper commands are listed in the following paragraphs. In addition, preliminary commands to describe the particular exercise may be used.

b. The control officer should insure that his commands are relayed to the pit officer so that he can keep abreast of the firing being conducted. This may be done by public address system or by telephone. Before each firing exercise, the control officer should inform the pit officer what the next exercise will be and give him any special instructions for target operation; for example, "The next firing will be for zero. Mark targets after each shot." Or, for slow fire, he may say, "The next firing will be eight rounds, slow fire. Mark targets after each shot."

c. Telephone operators are used to relay commands to the pits as necessary and to pass on special instructions to target operators as requested by the coaches. They should be informed that at no time are they to make known the identity of a firer on a particular firing point. The following commands are those normally required to be relayed to the pits:

MARK TARGET NUMBER _____. (This indicates that the target has been fired upon, but has not been withdrawn for marking.)

DISK TARGET NUMBER _____. (This indicates that the target has been withdrawn and a spotter placed in the hit, but the appropriate disk has not been used to show the value of the hit.)

RE-DISK TARGET NUMBER _____. (This indicates that the target was disked, but the value was not observed or understood by the firer.)

d. Officers and noncommissioned officers along the firing line work closely with the control officer. See paragraph 84b.

e. The control officer may use either of two control systems for conducting firing, basing his choice on his unit's training situation. The two systems are described below.

(1) *Infiltration squadding.* Firers are moved to the firing line by the coaches as a point becomes vacant. This system is used in preference to mass squadding ((2) below) whenever possible during instruction firing as it allows the coach to keep a firer on the line for additional instruction if the situation warrants. In using this system the coach must work his targets individually, make sure commands are relayed to the pits correctly, and see that each weapon is cleared before a firer moves off the line.

(2) *Mass squadding.* With this system, orders are moved to the firing line at one time. It provides for better control and is safer than infiltration squadding. This system must be used for all timed exercises and it should be used at other times when experienced coaches are not available or are available in limited numbers.

88. Conduct of Zeroing

a. The procedure for zeroing is explained in paragraph 75. The rifleman should be given the settings in elevation shown in chart III for his

initial sight settings at each range. Once the zeroing process is started, the rifle should not be disassembled for cleaning or repair, unless absolutely necessary, until the completion of the combat qualification course. Disassembly and assembly during firing destroys the bedding of the receiver and stock which changes the zero. The rifle is cleaned during this period without disassembling it.

b. The following commands are used for the conduct of zeroing:

FIRERS, ASSUME THE _____ POSITION
 COACHES, PICK UP 9 ROUNDS OF AMMUNITION
 LOCK, ONE ROUND, LOAD
 COMMENCE FIRING WHEN READY
 CEASE FIRING

Chart III. Elevation Settings

Range	Setting
100 yards-----	13 clicks.
200 yards-----	12 clicks (100-yd. zero less 1 click).
300 yards-----	14 clicks (200-yd. zero plus 2 clicks).
500 yards-----	21 clicks (300-yd. zero plus 7 clicks).

Note. At 200 yards, an elevation setting of 1 click less than that required for 100 yards is necessary for the following reason: The rifle is zeroed at 100 yards to hit 6 inches above the point of aim. This same sight setting at 200 yards would cause the bullet to strike 8 inches above the point of aim. Therefore, it is necessary to use 1 click less at 200 yards so the bullet will hit 2 inches lower, or 6 inches above the point of aim.

c. After each shot is fired the targets are pulled and marked without command. When zeroing has been completed, the control officer

insures that the firing line is clear by commanding CLEAR ON THE RIGHT? CLEAR ON THE LEFT? THE FIRING LINE IS CLEAR.

89. Conduct of Slow Fire

a. The following commands are used for the conduct of slow fire:

FIRERS, ASSUME THE _____ POSITION
COACHES, PICK UP 8 ROUNDS OF AMMUNITION
LOCK, ONE ROUND, LOAD
READY ON THE RIGHT?
READY ON THE LEFT?
READY ON THE FIRING LINE
COMMENCE FIRING
CEASE FIRING

b. A time limit of one minute per round is established for slow fire. For this reason, COMMENCE FIRING should not be given until all firers are ready. The time limit should be adjusted to the benefit of the firer in cases of slow pit operation, faulty target equipment, weapon malfunction, or when time is used for additional instruction (except during record firing). After the completion of a slow fire exercise, the firing line is cleared as described for zeroing exercises (par. 88).

90. Conduct of Rapid Fire

a. The following commands are used for the conduct of rapid fire exercises:

FIRERS, ASSUME THE _____ POSITION

RISE, KEEPING YOUR FEET IN PLACE
COACHES, PICK UP 1 CLIP OF 8 ROUNDS
AND 1 LOOSE ROUND
LOCK, ONE ROUND, LOAD
READY ON THE RIGHT?
READY ON THE LEFT?

READY ON THE FIRING LINE (This is the signal for the pit officer to take over, present the targets, and have them withdrawn after 50 seconds.)

b. When the targets are withdrawn, the control officer checks to see if there are any alibis or re-fires. After alibis have been fired, he notifies the pit officer to mark all targets and clears the firing line as described in paragraph 88.

91. Pit Operation

a. *General.* The pit officer is responsible for the organization, orientation, and safety of the pit detail. The success of known-distance firing depends largely upon the efficient operation of the targets and the close coordination maintained between the pit officer and the control officer. All operators must be familiar with the proper procedure for operating and marking the targets.

b. *Marking Targets for Zeroing and Slow Fire.* Targets are marked after each shot, without command and as quickly as possible. During slow fire, the firer has a time limit of one minute for each shot. Twenty seconds is considered the maximum time limit for marking. A spotter is placed in the hit regardless of its location on the target and then the value is indicated by the appropriate disk. Each time the target is marked, the spotter is removed from the previous

hit and the hole is pasted. (Three-inch spotters are used for 100, 200, and 300 yards; five-inch spotters are used for 500 yards.) During infiltration squadding, the coaches periodically call the pits to have their targets pasted before a succeeding firer uses them.

c. Operating and Marking Targets for Rapid Fire. Targets are operated on order of the pit officer during rapid fire exercises. When the pit officer receives word that the firing line is ready, he has a centrally located red flag waved three times and then withdrawn. He then gives the command, TARGETS UP, or uses a prearranged whistle or hand signal. He starts timing the exercise when the targets are fully raised. At the end of fifty seconds he gives the signal to lower all targets. Individual targets are then raised for alibis or refires, based on information received from the firing line. Next, the pit officer has the targets marked. Spotters are placed in each hit if the group is large. If the group is small, only enough spotters are placed to indicate its location to the firer.

d. Disking the Targets. Each hit is disked, starting with the highest value, and the pit officer has the targets pasted after making sure that all firers have received their scores. The value of each hit or miss is indicated as follows:

- (1) Five (bull's-eye): The *white disk* is held over the bull's-eye momentarily and then withdrawn.
- (2) Four: The *red disk* is placed just below the bull's-eye, then is moved over the spotter and withdrawn.

- (3) Three: The *white disk with a black cross* is placed just below the bull's-eye, then is moved over the spotter and withdrawn.
- (4) Miss: The *red flag* is waved once across the face of the target.

Note. If a hit touches a line, it is given the value of the higher adjacent scoring area.

92. Regulations for Known-Distance Instruction Firing

The following regulations govern the conduct of known-distance firing. For regulations concerning safety, see appendix III.

a. Shooting jackets, gloves, and pads may be used if they do not give artificial support.

b. The sandbag support may be used for zeroing rounds only.

c. The use of elbow or heel holes which form artificial support for the elbows, arms, or legs, is prohibited.

d. The use of binoculars and spotting scopes is authorized.

e. All shots fired on the wrong targets are recorded as misses in both slow and rapid fire.

f. During slow fire, if a target shows two hits, the following rules govern:

(1) If the hits have the same value, both hits are spotted but only one is disked.

(2) If the hits have different values, both are spotted and the one with the highest value is disked.

g. During rapid fire, if more than nine hits appear on a target, the following rules govern:

- (1) If all hits are of equal value the firer receives credit for the value of nine rounds, providing he fired the required number of rounds.
- (2) If the hits are not of equal value and the individual fired the required number of rounds, he has the option of receiving the value of the nine lowest hits or refiring the exercise.
- (3) If the firer did not fire the required number of rounds through his own fault, he receives credit for the hits of the highest value equal to the number of rounds he fired. He is given a miss for each unfired round.

h. All rounds fired before the command COMMENCE FIRING or after the command CEASE FIRING are scored as misses.

i. All rounds fired are recorded even though the rifle may have been accidentally discharged.

j. Ricochet hits are recorded as misses.

k. During rapid fire exercises, the firer is given an alibi for a failure of the rifle to function properly due to mechanical defects or to defective ammunition. It is the responsibility of the firer to immediately notify an officer or noncommissioned officer on the line to have his malfunction verified. He is required to refire the exercise. If time or ammunition allocation does not permit refiring the exercise, the soldier may fire the remaining rounds with a time limit of four seconds per round.

l. If a target is withdrawn just as a shot is fired

during slow fire, the shot is disregarded and the firer is given another round.

m. If a target is withdrawn during a rapid fire exercise, the firer is permitted to refire the complete exercise.

n. In cases of slow target operation during slow fire, the firer must notify an officer or noncommissioned officer on the line before completing the exercise in order to receive additional time.

o. As a general rule in scoring rapid fire targets, only those hits which are visible will be scored. An exception will be made in the case where the grouping of three or more shots is so close that it is possible for a required shot or shots to have gone through the enlarged hole without leaving a mark. In this case, the shooter will be given the benefit of the doubt and scored a hit.

Section IV. KNOWN-DISTANCE RECORD FIRING

93. Organization

The range is organized for record firing as described in paragraph 86 and shown in figure 93 with the following changes or additions:

a. One officer or noncommissioned officer in the pits per eight targets to supervise and verify scoring.

b. One scorer in the pits per two targets to record scores. Scorers position themselves between the two targets they are responsible for.

c. One noncommissioned officer per eight firing points to cross-check firing line scorecards with the pit scorecards. The coaches may be used in this capacity.

d. One scorer per firing point to record scores

from the firing line. The coaches or riflemen in one order of the unit undergoing training may act in this capacity.

94. Conduct of Firing

The procedure for the conduct of record firing is the same as for instruction firing (pars. 87-92) with the following exceptions:

a. Time must be allowed after each order has completed firing to permit the line scorecards to be checked against the pit scorecards.

b. During slow fire, the scorers on the firing line are required to announce the value of each shot as it is recorded so that the firer can hear it. They do this by stating the target number, the number of the round, and its value. This tells the firer that his score has been recorded and that he is cleared to fire his next round.

c. When a target is disked after a rapid fire exercise, the scorer is required to announce the target, the number of 5's, 4's, 3's, and misses, and the total score.

d. Noncommissioned officers along the firing line distribute scorecards to the scorers on firing points within their assigned block and collect them from each order as soon as it completes the firing. They are responsible for seeing that the scorers maintain the scorecards properly.

95. Scoring Procedure for Record Firing

a. General. During record firing, scores are recorded at the pits and the firing line on scorecards that are detached from DA Form 83. Sample scorecards properly filled out on the line and in the pits are shown in figure 86. The cards

should be filled out in pencil (preferably indelible). No erasures are permitted. If an error is made, it should be lined out and initialed by an officer. Note that the firer's name is not entered on the pit scorecard; only his target and order number.

b. Slow Fire. When a shot is fired, the target is withdrawn and checked by the scorer. He locates the hit, circles it, and writes the number of the shot beside it. He examines the target closely to make sure that there is only one hit. He then instructs the target operator to mark the target while he records the value of the shot on the scorecard. The same procedure is followed for each round. Hits are not pasted until the target has been verified by the officer in charge of the block of eight targets. When the firing exercise is completed, the officer checks the hits on each target against the scorecard record. When he is satisfied with the check, he tells the operator to paste the target. He retains the scorecards as he checks and compares his scores with those recorded by the noncommissioned officer assigned to the corresponding block on the firing line. If the pit and line scores do not agree, an officer on the firing line rules on the discrepancy. Generally, the pit score is considered the deciding factor, but reasonable doubts are ruled in favor of the firer.

c. Rapid Fire. At the completion of a rapid fire exercise, the scorer in the pits checks the hits on the target and enters the values on the scorecard. If he finds too many hits, he immediately notifies the officer in charge of his block of targets

who in turn informs the firing line. The discrepancy is handled according to the instructions in paragraph 92*g*. After the scorer records the score, he has the target operator mark the target. The target is not pasted until the score has been verified by the officer. The pit and line scores are then checked as they are for slow fire.

d. Scores. At the completion of record firing, all scorecards, both line and pit, are collected. Each line card is checked against the corresponding pit card and signed by an officer. Any discrepancies are resolved by changing the line scorecard to agree with the pit scorecard. Once this check has been completed and the line card has been signed by an officer, it becomes the official record of firing.

96. Regulations for Record Firing

In addition to the regulations listed in paragraph 92, the following rules govern record firing:

- a.* No coaching is permitted.
- b.* Firers are not permitted to have in their possession rounds in excess of the number required for a particular exercise.
- c.* Warming or sighting rounds are not permitted, since initial firing is conducted at 100 yards.
- d.* Members of the pit detail are not informed of the identity of a firer on any particular target.
- e.* No zeroing is permitted during record firing unless specifically approved by the control officer. Generally, this is approved only for a replacement weapon or for one that has been repaired since it was zeroed.

f. A firer may challenge the scoring of his target if he disagrees with it. He must immediately announce his challenge to an officer or noncommissioned officer on the firing line. The officer or NCO then directs that no further rounds be fired on the target, and has the officer in the pits personally check it. The firer and line scorer are told the results of the investigation and the firer is notified to resume firing.

97. Setting the Battle Sight

a. At the completion of known-distance firing, the battle sight is set for use in the combat firing phase of marksmanship training.

b. The battle sight setting is the 300-yard zero in elevation *less two clicks*. When two clicks are subtracted from the zero elevation, it causes the rifle to be zeroed to the *point of aim*. In other words, the location of the shot group is moved from the center of the bull's-eye to the lower edge. With this sight setting, the rifleman can hit his point of aim at 300 yards and can engage man-sized targets at ranges from 0-400 yards by aiming at the center of mass.

c. The rear sight is calibrated to the battle sight setting as follows:

- (1) Run the aperture all the way down and loosen the screw in the center of the elevating knob until you can turn the knob forward.
- (2) Turn the elevating knob forward until the 300-yard index line is opposite the index line on the receiver.
- (3) Turn the elevating knob forward from this point the number of clicks equal to

the 300-yard zero in elevation less two clicks.

- (4) Hold the elevating knob in position with your left hand and tighten the center screw, then run the aperture all the way up and again tighten the screw.
- (5) Check your setting by turning the elevating knob back until the 300-yard index line is opposite the index line on the receiver, then turn it forward as far as you can, counting the clicks. The number of clicks you are able to turn the elevating knob forward should be equal to your battle sight setting.

d. Use the following procedure to set the battle sight on the old type sight (with locking nut) :

- (1) Set the 300-yard zero in elevation less two clicks. Lock the rear sight at this setting by tightening the locking nut.
- (2) Loosen the screw in the center of the elevating knob and turn the knob until the battle sight index line is opposite the index line on the receiver.
- (3) Tighten the screw in the center of the elevating knob.
- (4) Check the setting as described for the other type sight (*c*(5) above).

e. When the rear sight has been calibrated to the battle sight zero, the range indicators on the elevating knob may be used. If the rifleman has time in combat, he can set the estimated range to a target on the rear sight and deliver more accurate fire. This is particularly advantageous when engaging targets at ranges over 300 yards.

CHAPTER 5

MARKSMANSHIP TRAINING—PHASE II, COMBAT FIRING

Section I. PURPOSE AND SCOPE

98. Purpose

Combat firing is taught immediately after known-distance firing. It develops individual marksmanship by requiring the rifleman to search for indistinct targets, to determine ranges, and to place accurate fire on targets within a limited time. It prepares the rifleman to participate as a member of the rifle squad in field firing exercises in which targets at various ranges must be engaged effectively.

99. Prerequisites of Combat Firing

Before taking up combat firing, the rifleman must have—

- a. Completed known-distance qualification firing.
- b. Received instruction in the technique of engaging moving targets.
- c. Received instruction in estimating range by eye (par. 142).
- d. Received instruction in the use of the battle sight setting to the extent that he knows he must

aim at the center of mass of the E type silhouette target and at the bottom of the F type silhouette.

100. Scope

Two phases of combat firing are prescribed for riflemen in the standard qualification course: combat position firing (table IV) and quick firing (table V). The tables are in appendix II. These exercises give the soldier practice in engaging targets at various ranges with the battle sight under simulated combat conditions and, in quick firing, shooting with the bayonet fixed.

Section II. COMBAT POSITION FIRING

101. Range

A combat position firing range of the type shown in figure 94 is used for firing table IV. The distances shown may be modified slightly to fit local terrain but, except for lane 6, no distance will be greater than 400 yards. (A range for automatic rifle transition firing (FM 23-15) may be superimposed on the first six lanes of this range, using the same pits and communications. Three additional pits in lanes 3 and 4 will be necessary if this is done.)

102. Conduct of Fire

a. Sight Setting. All firing, except on the target in lane 6, is done with the battle sight.

b. Targets.

- (1) An "F" type silhouette target is used for ranges less than 200 yards, except in lane 5 where "E" type silhouettes are used. The "E" type silhouette targets

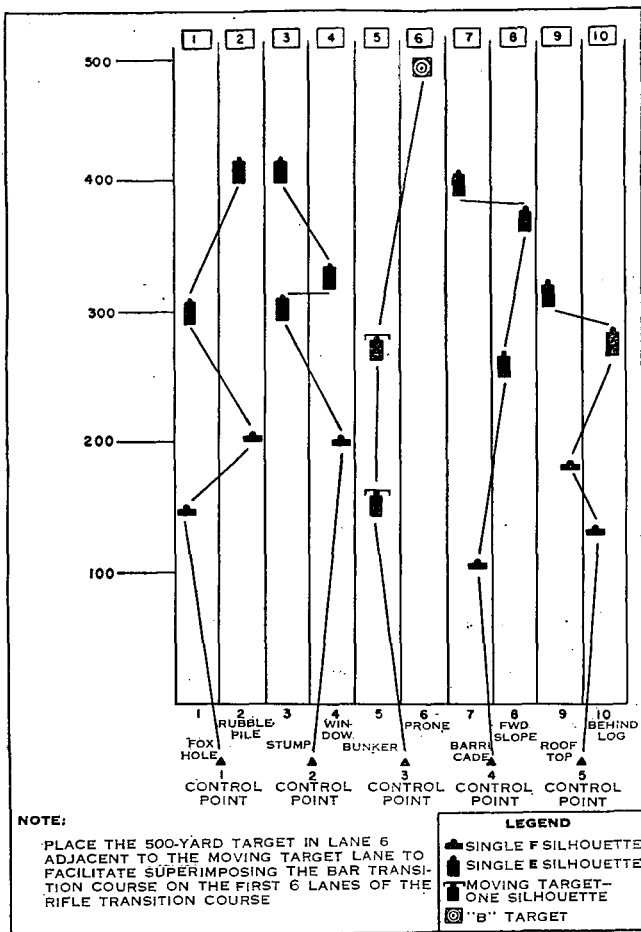


Figure 94. Layout for combat firing range.

in lane 5 traverse right and left for 30 feet. The direction of movement differs for each target.

- (2) An "E" type silhouette is used at ranges over 200 yards except in lane 6 where a "B" target is used.

c. Ammunition. A maximum of four rounds of ball ammunition may be used on each lane. A maximum of two rounds may be used to engage the first target exposed in each lane, but if this target is hit with the initial round, the three remaining rounds may be used to engage the second target. In lane 6, all four rounds are fired at the "B" target.

d. Positions. See figures 95-105 for the firing positions for table IV. The firer should stand well back from the window when firing lane 4 (fig. 98), because in combat he will expose himself if he stands too close to it.



Figure 95. Standing foxhole position for lane 1.



Figure 96. Rubble pile position for lane 2.



Figure 97. Stump position for lane 3.

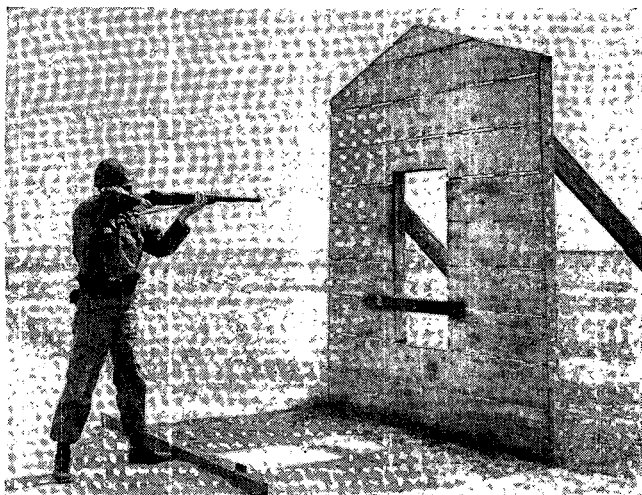


Figure 98. Window position for lane 4.

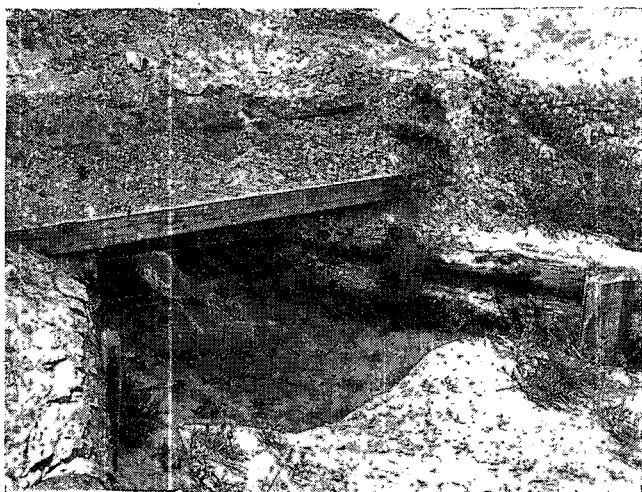


Figure 99. Outside view of bunker on lane 5.



Figure 100. Inside view of bunker on lane 5.



Figure 101. Prone position for lane 6.



Figure 102. Barricade position for lane 7.



Figure 103. Forward slope position for lane 8.



Figure 104. Rooftop position for lane 9.



Figure 105. Log position for lane 10.

103. Procedure for Firing

a. Control. Firing is controlled by an officer. He is assisted by a noncommissioned officer (scorer) at each firing point. Each set of two lanes has a control point (telephone) operator who controls the raising and lowering of the targets by verbal instructions to the pit operators.

b. *Scorers.* The noncommissioned officers (scorers) —

- (1) Supply the firers with ammunition.
- (2) Designate the limits of the firing lanes.
- (3) Signal the control point operators for targets to be exposed, observe the targets for hits, and record the scores. (The control point operator tells the scorer for lane 6 the number of hits made in that lane.)
- (4) Keep constantly on the alert to insure that safety precautions are carried out and, on orders of the officer in charge, see that weapons are cleared.

c. *Suggested Method of Range Control.*

- (1) The men are detailed to firing orders of 11 men each and they line up behind the firing points on each lane. The eleventh man stands behind lane 1. On command of the officer in charge, each firer in the first order examines his rifle to see that it is ready for firing, checks his battle sight setting, moves to the firing point, and assumes the position required for the lane.
- (2) On a ready signal from the scorers, the officer in charge commands:

LOCK, EIGHT ROUNDS, LOAD
READY ON THE RIGHT?
READY ON THE LEFT?
READY ON THE FIRING LINE

The control point operator has a pit operator display a target in each lane when READY ON THE FIRING LINE

is given. The sequence of target exposure in any lane should not be fixed. This will require each firer to search for the targets.

- (3) Each target is exposed for 30 seconds unless it is hit. When the target appears, the firer engages it. If he does not get a hit with his first round, he fires one more round. As soon as the target is hit, the pit operator twirls the target, withdraws it immediately, and the second target is exposed. If the firer fails to hit the first target, it is withdrawn after it has been exposed for 30 seconds and the second target is then exposed for 30 seconds unless it is hit. The control point operator does the timing.
- (4) In lane 6, the firer has one minute to estimate the range, set the elevation on the rear sight, and fire four rounds at the B target. This target represents the front of a wheeled vehicle, so the pit operator records all hits on the frame as well as the target and reports them to the control point operator.
- (5) After completing a lane, each firer moves to the next position to the right, except the man on lane 10. This man goes left to lane 1 and waits while the eleventh man in the order fires that lane. Thus the man on lane 10 does not have to double time to lane 1. This procedure is repeated until each man has fired on all

10 lanes. The men change lanes on command of the officer in charge and only after all weapons have been cleared. When the first order has finished, the second order goes through the course. Table V may be run concurrently with table IV, and other training may be conducted in the rear at the same time.

Section III. QUICK FIRING

104. The Range

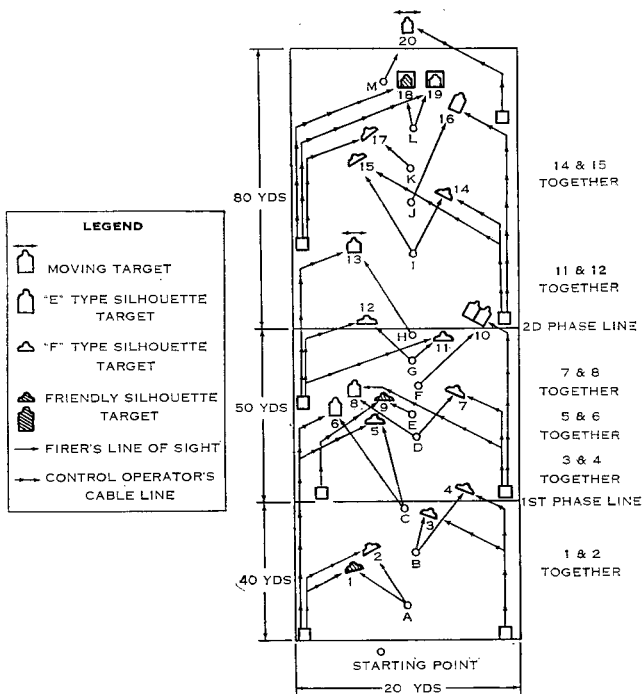
A quick-firing range of the type shown in figure 106 is used for firing table V. The number of lanes that can be used simultaneously is determined by local terrain and safety problems. (With minor modifications, this range can be used for the quick-firing course for the automatic rifle (FM 23-15) and for the carbine (FM 23-7).)

105. Target Operation

Follow the discussion in this paragraph by referring to figure 106.

a. A single silhouette target represents an enemy rifleman and is exposed for three seconds. A double silhouette target represents an enemy automatic weapon and is exposed for four seconds. Two single silhouette targets that are raised simultaneously are exposed for four seconds. A moving silhouette target is exposed for five seconds.

b. Three silhouettes (one in each space between phase lines) are painted or marked to represent friendly soldiers. They are used to test the firer's reaction to friendly troops; he should *not* fire on



21 TARGETS--18 ENEMY AND 3 REACTION

Figure 106. Quick-firing course for table V.

them. (These targets are discussed during the orientation and the riflemen are told the scoring penalty for firing on them. See also note 2 to table V, appendix II.)

c. Phase lines are placed beyond targets 3 and 11 to permit the rifleman to reload and to aid in the enforcement of safety precautions. Although targets 3 and 4 are on opposite sides of the first phase line, they are exposed together. The rifle-

man engages both of them from position B, as well as targets 5 and 6 from position C, before stopping to reload. Similarly, he engages targets 12 and 13 before reloading at the second phase line. Targets and friendly silhouettes between phase lines are exposed in numerical sequence on the signal of the safety officer or lane control personnel. The signals must not be visible or audible to the firer.

106. Firing Procedure

a. A control officer is responsible for conducting the firing. A safety officer supervises the moving firing line and is responsible for enforcing safety regulations. A noncommissioned officer (lane operator) accompanies each firer through the course to aid in enforcing safety regulations, regulate the rate of advance, signal target operators for target exposure (when this is not done by the safety officer), collect unexpended ammunition, and critique the firer upon completion of firing. A scorer follows each firer closely. He records the number of targets that are hit and pastes or marks the bullet holes.

b. Before firing table V for instruction, each rifleman fires eight preliminary rounds to adjust his fire. This preliminary firing is conducted on an easily prepared range. See note 1 in table V, appendix II, for details.

c. When the preliminary firing has been completed, each firer is assigned an order number and a lane and is returned to the starting line for instruction firing. At the starting line, a control officer orders the firer to fix bayonet, and lock and load

eight rounds. The firer carries two additional clips in his belt.

d. On signal from the control officer, the firer unlocks his rifle and advances down the lane, carrying his rifle in the underarm position (par. 56 and fig. 70). As the targets are exposed, he fires on them from the underarm position.

CHAPTER 6

MARKSMANSHIP TRAINING—PHASE III, NIGHT FIRING

Section I. PURPOSE AND SCOPE

107. Introduction

a. This chapter describes the rifleman's individual training in firing at night without artificial illumination or special equipment, and the ranges on which the firing is conducted. Individual night firing is conducted only when the illumination is no greater than that afforded by a half-moon. This degree of darkness is needed to give the rifleman the practice he needs and to insure that he will gain confidence in his ability to deliver accurate fire when visibility is extremely limited.

b. To be of greatest value, this training must closely follow daytime record fire, and it should be completed in two successive nights and the intervening day.

c. The training is presented in four phases—

- (1) Orientation firing.
- (2) Technique of night firing.
- (3) Day instruction firing.
- (4) Night instruction and record firing.

108. Ranges

a. An individual night firing range (fig. 107) may be laid out on level or rolling terrain that is

shielded or located away from artificial illumination. A dark background downrange is desirable to prevent the targets from being silhouetted. In most instances, the area behind a known-distance range will be satisfactory. The targets are fired on at two ranges: either at 25 and 50 yards or at 50 and 75 yards, depending on the amount of moonlight.

b. A day instruction firing range may be set up on any terrain where frames can be erected 50 yards from the firing line to hold B type targets.

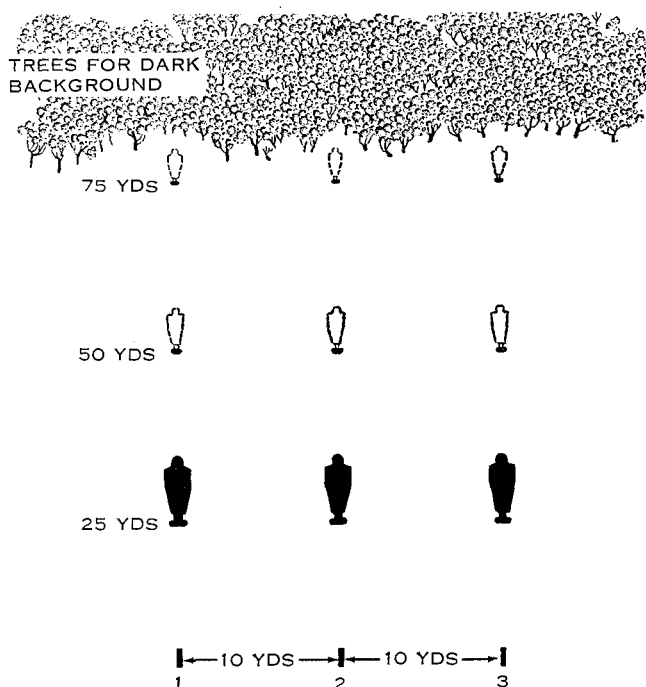


Figure 107. Individual night firing range.

Section II. ORIENTATION FIRING

109. General

a. This phase presents the problems of night firing by allowing the rifleman to use his own method of engaging the target (table VI in appendix II). He receives no instruction that will help him to overcome the difficulties in locating and firing on it.

b. Each order is critiqued after firing. The most common difficulties that should be discussed in the critique are—

- (1) *Target detection.* Some of the men will be able to see the target only indistinctly, even at the closest range used in orientation firing. The instructor should remark that target detection in night combat will be even more difficult, but that after the riflemen learn how to scan in the dark and use offcenter vision, they will be able to locate and define a target more easily.
- (2) *Inability to use sights.* The men will have found that they cannot use their sights successfully—that the peep looks solid and the front sight, *as well as the target*, is lost in darkness. The instructor tells them that they will be able to make up for this with a new method of alining the weapon: the pointing technique. He assures them that with practice the pointing technique will give them an astonishing degree of accuracy.
- (3) *Effect of the muzzle flash.* The flash momentarily affects the rifleman's vision.

He must wait a second or two after each shot to let his eyes readjust to darkness. By using a flash hider, the flash's effect on vision is minimized and the rifleman can maintain a steady rate of fire.

110. Organization and Conduct of Firing

a. Equipment.

- (1) One M type target for each firing point.
- (2) One flashlight with red filter for each assistant responsible for control.
- (3) White chalk for marking hits.
- (4) Scorecard and pencil (record firing only).
- (5) Ambulance.
- (6) Public address set.

b. Control Personnel.

- (1) One control officer.
- (2) One safety officer per 15 points.
- (3) One control assistant for each 5 points.

c. Conduct of Firing. The safety officers are assigned letter designations: Alfa, Bravo, etc. The control assistants are designated Alfa 1, Alfa 2, etc.

- (1) At the direction of the control officer, the first order moves to the firing line and assumes the prone position.
- (2) Safety officers report verbally to the control officer when all assigned points are occupied and UP.
- (3) When all riflemen in the order are ready, the control officer asks, "Is there anyone downrange?" Anyone who is downrange when this question is asked sounds

off immediately. When the control officer is sure that the range is clear, he directs the control assistants to issue one clip of ammunition to each firer.

- (4) He then gives the command to load and fire.
- (5) When the order has completed firing at the near range, the control assistants have their men clear rifles and notify their safety officer. The control officer directs all firers to lean their weapons against the numbered stakes at the firing points and go to the targets to watch the scoring.
- (6) The control assistants mark and score the targets in the presence of the firers. The firers then move their targets to the far range and return to the firing line. They fire on the targets at the far range, watch as they are marked, then move the targets back to the near range. All firing orders follow the same procedure.

Section III. TECHNIQUE OF NIGHT FIRING

111. General

a. The technique used to overcome the difficulty in locating targets is taught by instruction and practical work in night vision. The technique for alining on the target is taught by lecture, demonstration, and practical work.

b. Trigger control is as important in night firing as it is in daylight firing. A "jerk" shot destroys the alinement of the rifle and generally results in a miss.

112. Sequence of Instruction

The instruction is given in the following sequence:

a. Principles of Night Vision. The four principles of night vision must be used in locating the target and keeping it in view (FM 21-75).

b. High Head Position. The head is held high to keep the mass of the weapon from obscuring the view to the target. Also, the field of vision increases and the sharpness of detail improves as the eyes are raised above ground level. Explain and illustrate these points with the training aid shown in figure 108.

c. The Use of Both Eyes. The firer greatly increases his ability to see at night and has a wider area of vision when he uses both eyes. Depth perception depends largely on the use of both eyes, especially in dim light.

d. The Pointing Technique. This technique means just what its name implies. The rifleman makes no attempt to *aim* with the sights: he

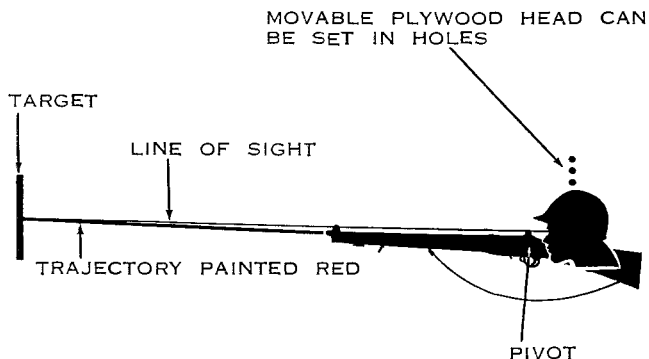


Figure 108. Normal firing position.

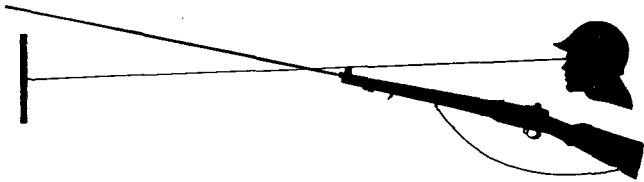


Figure 109. Tendency to raise muzzle to line of sight.

simply points the rifle at the target. When he does this with his head held high and both eyes open, he will, at first, have a tendency to fire high and to the left. This is because he unconsciously lifts the muzzle to his line of sight and to the left, centering it between his eyes. Explain and illustrate this with the training aid shown in figure 109. Assure the rifleman that, with instruction and practice, he will learn the "feel" of a correctly pointed weapon (fig. 110) and will soon get a surprising percentage of hits with the pointing technique.



Figure 110. Pointing the rifle while head is held high.

Section IV. DAY INSTRUCTION FIRING

113. General

The rifleman fires table VII (app. II) to get practice in the night firing technique. The range is described in paragraph 108b.

114. Organization and Conduct of Firing

a. Equipment.

- (1) One B target per firer in each order.
- (2) Three mid-range spotters per target.
- (3) Black and buff pasters.
- (4) Material to cover rear sight.
- (5) Public address system.
- (6) Ambulance.

b. Control Personnel.

- (1) One control officer.
- (2) One safety officer per 20-25 points.
- (3) One control assistant per 5 points.
- (4) One order to act as coaches.

c. Conduct of Firing.

- (1) The control officer has the riflemen cover the sights of their rifles. He then directs the men in the first order to assume the night firing prone position at the firing points.
- (2) The control assistants see that the riflemen use the correct position, giving them plenty of time to make adjustments. The men take the normal prone position, holding the rifle as usual, the left elbow well under the weapon and the butt firmly against the shoulder. But the head is held high so that the eyes are well above the line of the sights. Placing the chin slightly above the comb of the stock will position the head correctly for most firers.
- (3) The coaches draw and issue ammunition on the control officer's order. They load

the rifles so that the firers do not have to change their position while firing a shot group.

- (4) Each rifleman fires five 3-round shot groups at the center of a B target at a range of 50 yards. After each shot group, the control officer has the firers lean their rifles on the firing point stakes and go to their targets with their control assistants. The control assistants mark and paste the targets and return to the firing line, accompanied by the firers.
- (5) The control assistants and coaches help their firers to adjust the strike of their shot groups by having them move the left hand forward or backward and by having them shift the body position right or left. By the time a firer has made his third or fourth group, he should be hitting consistently in the black and be familiar with the feel of a correctly pointed weapon.

Section V. NIGHT INSTRUCTION AND RECORD FIRING

115. Night Instruction Firing

Table VI (app. II) is fired once for practice. The range is organized and firing is conducted like orientation firing except that the riflemen use the night firing technique learned in day instruction firing. All riflemen should be given an opportunity to discuss any individual problems which may remain after this firing.

116. Record Firing

Table VI is now fired for record. Record firing is conducted like night instruction firing except that it is scored. Each hit on the target is counted as five points and the scores are entered on the firer's qualification card. The maximum score attainable is 80. A minimum score of 25 is necessary to confirm the qualification attained in the known-distance phase of the combat qualification course.

CHAPTER 7

ADVANCED MARKSMANSHIP—SNIPING

Section I. THE SNIPER

117. Definition

A sniper is an expert rifleman trained in the use of sniping equipment and in the technique of sniping. A soldier is selected for sniper training because he has become an expert rifleman and has demonstrated skill in the tactics of the individual soldier. Most of his sniping training is devoted to firing the sniper rifle and to practicing the techniques of sniping. The sniper must have a high degree of proficiency in—

- a.* Shooting.
- b.* Range estimation.
- c.* Use of cover, concealment, and camouflage.
- d.* Use of maps, sketches, aerial photographs, and compass.
- e.* Quick recognition of enemy personnel and equipment.
- f.* Movement without detection.
- g.* Ability to endure long periods of waiting.

118. Mission

a. The sniper's mission is to kill individual enemy soldiers with single rifle shots, very quickly aimed, if necessary. He will never fire a rapid

succession of shots, except in self-defense. As a guide, the standard of shooting demanded of a sniper enables him to hit, with regularity, a man's head at ranges up to 200 yards and a man's trunk at ranges up to 400 yards. This standard may be surpassed: under favorable weather conditions and assuming that a target can be located, there is a chance of hitting a man's body as far away as 1,000 yards. Unless there is some very special reason for shooting at such a range, it should be discouraged.

b. The sniper chooses targets according to their value. He makes every shot count and avoids firing constantly or unnecessarily. Indiscriminate firing discloses his position, draws enemy fire, and deprives him of shots at valuable targets. He attempts to pick off the key enemy individuals—officers, noncommissioned officers, gunners of weapons, observers, and any enemy personnel engaged in some special task. Snipers have been known to put enemy weapons out of action by hitting them with an AP bullet.

c. The sniper is an information-collecting agent for the commander. In his constant search for targets, he becomes familiar with the enemy and the terrain, and he observes and reports enemy activities in his sector. It must be emphasized, however, that his primary task is to seek out and kill the enemy.

d. The sniper weakens the enemy's resistance, efficiency, and morale by harassing him with accurate sniping and limiting his observation. When targets become scarce, it is an indication

that the sniper's mission has been partially accomplished.

119. Sniping Methods

The sniper is first of all a rifleman in the squad. In a great many tactical situations, his firepower is integrated with the squad or team application of fire. In some tactical situations or as time permits, the squad leader or a higher commander will be able to use the sniper's ability to deliver accurate fire at slightly longer ranges by employing him as a mobile sniper or as a member of a sniper team.

a. A mobile sniper moves from one firing position to another as often as the search for fields of fire and targets requires. He covers a large and not necessarily fixed sector. He acts alone, but may get assistance from troops in the area in locating targets.

b. A sniper team consists of two men: a sniper and a squad rifleman, or the snipers from two squads. The team snipes from carefully selected positions called sniper posts. Each post has an assigned sector of fire. When one post is disclosed, or the sector lacks targets, the sniper team moves to another post. If both team members have equal ability as snipers, one observes and locates and points out targets for the other to engage for 15 to 20 minutes, then they exchange jobs. If one member of the team is not a qualified sniper, both take turns observing, but the sniper engages the targets. The team may be provided with a binocular or an observation telescope.

Section II. THE M1C SNIPER RIFLE

120. General

The M1C (fig. 111) differs from the M1 rifle in that it has an M84 telescope mounted on the receiver and a cheek pad assembly installed on the stock. The telescope is held in a removable mount that has a dovetailed slide that mates with a bracket on the receiver. A T37 flash hider is furnished as part of the M1C.

121. M84 Telescope

a. A telescope sight enables the sniper to aim with great accuracy. It has several advantages over the ordinary rifle sights. Its magnification gives a better view of the target. The cross hair or sight post is more distinct than the front sight on the M1, and covers a smaller area on the target. The target and reticle both appear in focus to the firer. This eliminates the need for attempting to aline a front and rear sight with the target. The telescope sight adds to the period of visibility at dawn and dusk, and increases the probability of hits at all ranges.

b. The M84 telescope sight has a 2.2 power magnification and gives a 27-foot field of view at 100 yards. The maximum field of view is obtained by placing the eye $3\frac{1}{2}$ to 5 inches back of the eyepiece. The reticle (or sight) consists of a vertical post and a horizontal cross hair (fig. 112). The post covers 3 minutes of angle, or 3 inches per 100 yards of range. The telescope sight is sealed with synthetic rubber gaskets and can be immersed in water without damage.

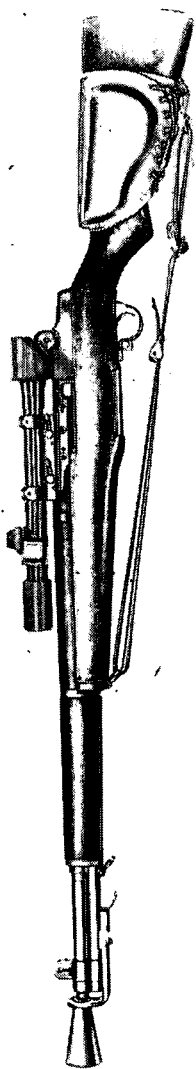
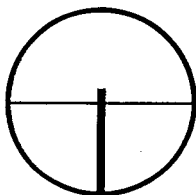


Figure 111. M1C sniper rifle.



M84

Figure 112. M84 telescope reticle.

c. With a telescope sight, the reticle is moved in the direction opposite to the one the firer wishes to move the strike of the bullet. This was taken into account in the design of the elevation and windage knobs. On the M84 telescope, for example, when the windage knob is turned in the direction indicated by the letter R, away from the firer, the reticle moves to the left but the strike of the bullet is moved to the right. When the windage knob is turned in the direction indicated by the letter L, toward the firer, the reticle moves to the right but the strike of the bullet is moved to the left. To raise the strike of the bullet, the elevation knob is turned in the direction of the higher number. This moves the reticle down, but the strike of the bullet is moved up.

d. The elevation adjusting knob (fig. 113) is mounted on top of the tube. It has a hinged protective cover that is held closed with a friction catch. The elevation screw has 32 threads to the inch. A complete turn gives 40 minutes of angular movement of the sight post. Each minute-of-angle change is held by a detent within the knob. While the click is not normally audible, it can be felt. One click equals one minute or one

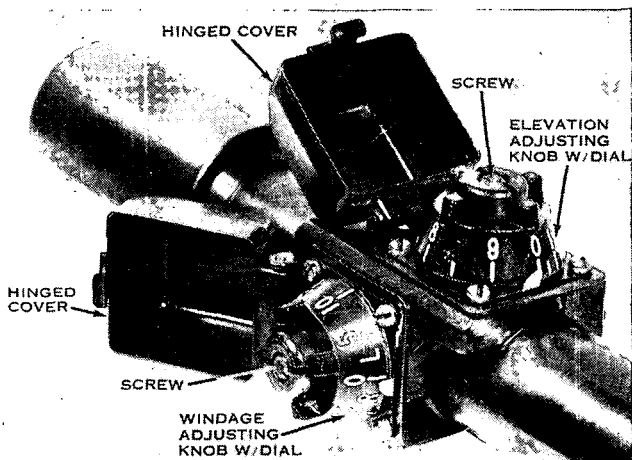


Figure 113. Adjusting knobs, M84 telescope.

inch per 100 yards of range. The elevation scale starts at zero yards and goes up to 900 yards with tick marks every 50 yards and numbers at the 100-yard indexes. When calibrated (par. 132) at any given range, the elevation knob is approximately correct from one to 900 yards.

e. The windage adjusting knob (fig. 113) is on the left of the tube. The windage scale is graduated from 20 minutes left, through zero, to 20 minutes right, and adjustments are in minutes of angle. One click equals one inch per 100 yards of range. A total movement of 100 minutes (two and a half turns of the knob) is available to permit the sight to be calibrated to correct for mount misalignment.

COMBAT EXAMPLE OF WINDAGE ADJUSTMENT: A sniper fires at an embrasure in an enemy position at a

range of 400 yards. His observer sees the bullet strike a clay bank about two feet to the right of the opening. Knowing that a one-click change at that range will move the strike of the bullet about four inches, the observer gives the sniper a correction of six clicks left.

f. The eyepiece shield, a synthetic rubber cylinder with a cut-away at the bottom, fits on the eyepiece end of the tube. It cuts down light reflection, gives protection from rain, and provides a nonmetallic surface for possible helmet contact. The shield should extend one inch beyond the tube. The objective, or opposite end of the telescope, is shielded by a lens shade. This is a metal retractible tube that can be extended one inch beyond the cover glass. It prevents light reflection that might give away the sniper's position.

122. Telescope Mount Group, M1C Rifle

This group consists of a mount base fixed to the receiver and a removable mount.

a. The mount base is semipermanently attached to the left side of the receiver by two taper pins and three Allen-head screws. The top of the mount base, which is male dovetail in shape, runs parallel to the bore of the rifle.

b. The removable mount consists of two 2-piece rings, secured to a slide, to hold the telescope.

- (1) The rings are made in two halves that are held together by screws. The slide is an oblong block.
- (2) The lower half of each ring is formed into a stud that fits into vertical holes

in the slide, one ring at each end. The rings are held in place by screws that pass up through the bottom of the slide into the studs. The screwhead in the front of the slide protrudes and forms a positioning stop for the slide on the mount base. The bottom of the slide, female dovetail in shape, matches the male dovetail part of the base.

- (3) Two locking levers (screws) hold a pressure plate (clamp) in a recess in the slide. When the levers are turned forward, the slide can be removed or replaced on the mount base. The levers are turned backward to lock the slide in place on the base. (Turning the locking levers backward pulls them, by their threads, tightly against the pressure plate whose inner side forms part of the female dovetail in the slide and clamps the male dovetail between the pressure plate and the opposing side of the female dovetail. This locks the telescope and removable mount in position on the rifle.)
- (4) To aid in unlocking the removable mount, there are two small springs under the pressure plate. These springs force the pressure plate outward when the locking levers are turned to the unlocked position. Two small stop screws on the left side of the slide and in the pressure plate make sure that the locking levers are in the correct position when unlocked.

123. Cheek Pad

The cheek pad (figs. 114 and 115) consists of a leather cover with a pocket that contains three removable felt inserts. It is laced onto the stock to form a cheek rest and bring the right eye in

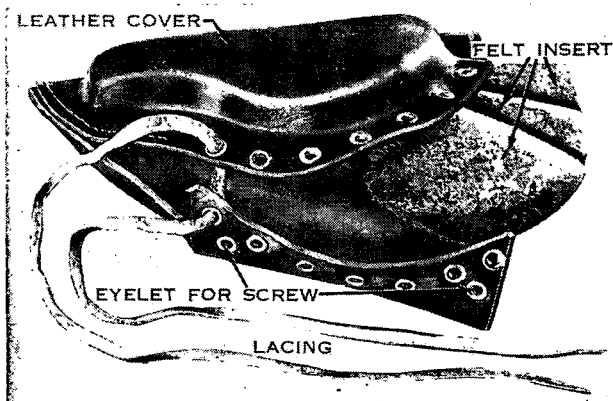


Figure 114. The cheek pad.

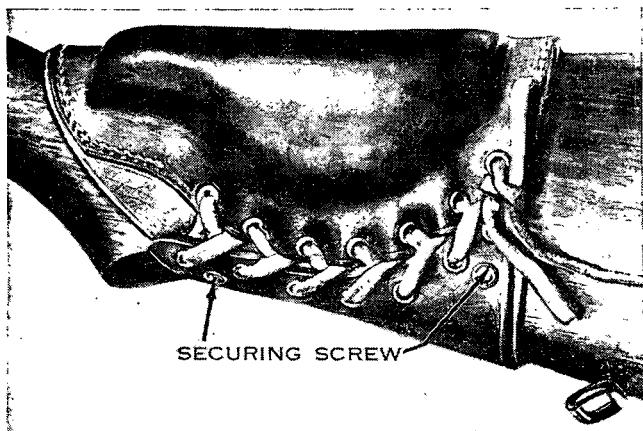


Figure 115. The cheek pad, mounted on the stock.

line with the offset telescope. The sniper adds or removes inserts to adjust the thickness of the cheek pad.

124. T37 Flash Hider

The T37 flash hider is an integral part of the gas cylinder assembly. It replaces the gas cylinder lock. If the rifle is zeroed with the T37, the sniper should remember that its removal and replacement with a conventional gas cylinder lock may cause a change in the zero. The flash hider should be left on the rifle and kept tight at all times.

Section III. RIFLE ASSEMBLY AND MAINTENANCE

125. Mounting the M84 Telescope

a. The telescope is issued assembled in its removable mount. If it has been disassembled, it must be reassembled as follows: Remove the two half rings by unscrewing the four locking screws. Place the telescope on the bottom of the two half rings so that the elevation and windage knobs are about one inch from the forward ring. Replace the two half rings and turn the screws enough to hold the telescope in place. (These screws are tightened firmly after the telescope has been fixed on the mount base and correctly positioned.)

b. To mount the telescope and removable mount on the rifle, turn the locking levers counterclockwise against the stops. Slip the female dovetail of the slide over the front end of the male dovetail on the mount base. Pull the telescope to the rear until the projecting screwhead in the slide con-

tacts the front end of the mount base. Turn both locking levers clockwise to lock the slide on the mount base. Both locking levers should be tightened at the same time and, so far as possible, with the same amount of pressure each time to maintain the same zero.

c. Place the rifle on a rest and sight through the telescope from a position directly to the rear with the eye $3\frac{1}{2}$ to 5 inches from the eyepiece. The post sight should be vertical and the cross hair horizontal. If the post is not vertical, turn the telescope in the removable mount. The telescope should be far enough forward so that the rubber eyepiece does not interfere with the elevation knob of the rear sight, and far enough to the rear so that a clip of ammunition can be loaded. When the post is vertical and the telescope correctly positioned, tighten the four locking screws tightly.

126. Telescope Sight Prefiring Checks

a. *Testing for Parallax.* Parallax is the apparent motion of a nearby object (sight reticle) in relation to a distant object (aiming point) when it is seen from different positions. To illustrate this simply, line up your forefinger with a distant object. Hold your finger steady and turn your head slightly while keeping your eye on the distant object. You will notice that your finger seems to move. This is parallax. To test a telescope for parallax after it is mounted on a rifle, place the rifle on a rigid support, sight through the telescope, and align the sight on an object at least 100 yards away. Move the head slightly from side to side and up and down. If there is any

movement of the sight in relation to the distant object, parallax is present and the telescope must be turned in for repair. Do not make this test at a range shorter than 100 yards. Parallax may be present at the short range but not at the ranges a sniper uses.

b. Focusing. The telescope is focused when it is adjusted optically so that the reticle (vertical post) and a distant object are both seen sharply. The focus of the M84 telescope is adjusted for the firer and does not require readjustment.

127. Mounting the Cheek Pad

The sniper mounts and adjusts the cheek pad to suit his own sense of comfort. Once the pad is correctly adjusted, it should not be necessary to remove it except to clean or dry it.

a. Place the cheek pad on the stock with the projecting cheek support to the left (fig. 115). Secure it temporarily in place by passing the lacing through the eyelets from front to rear and back and forth, then mount the telescope on the rifle. Adjust the pad until it is in the best position as a cheek rest when you sight through the telescope. If the pad is too thick, remove the center insert. When adjusted, the pad should be well up and forward toward the small of the stock. Pull the lacing tight and tie the ends in a bowknot. The outline of the cheek pad may be traced lightly in pencil on the stock to assist in keeping it mounted always in the same place.

b. Secure the cheek pad to the stock by running the two brass screws provided through the two spare eyelets in the right side of the cheek pad and screwing them into the stock.

128. Care of the Rifle and Telescope

a. The rifle is maintained exactly as described in paragraphs 30-34. The sniper should not disassemble his rifle unless he is required to do so. Excessive disassembly may cause the zero to change, and may loosen the gas cylinder on the barrel and wear the locking lugs in the trigger guard.

b. Keep the cheek pad clean, smooth, and free from oil and moisture; otherwise it will chafe your cheek when firing. If the leather becomes dry and hard, remove the pad from the stock, remove the felt inserts, and apply neat's-foot oil sparingly to the finished side of the leather. Wipe off the excess oil and rub the leather to a polish. If the pad gets wet, remove it from the stock, remove the felt inserts, and dry all parts thoroughly.

c. The telescope is a delicate instrument; handle it with care. Check and tighten all mounting screws periodically. Keep the rubber eyeshield clean and free from oil and grease. Keep the lenses free from oil and grease and never touch them with your fingers because body grease and acid from perspiration injure them.

d. Do not twist the sunshade when sliding it forward. A threaded ring in the front end of the tube positions the sunshade when it is extended. Check this ring occasionally to see that it has not worked loose.

e. Do not allow the telescope to remain in direct sunlight, and avoid letting the sun's rays shine on the lens. Direct sunrays and excessive heat damage the lens elements. When the telescope is

mounted, slide the sunshade forward to protect the front lens. When exposed to the sun for a considerable period through necessity, keep the telescope completely covered.

f. Keep the hinged covers on the elevation and windage knobs down except when changing the sights.

g. To clean the exterior of the telescope, first slide the sunshade forward. Clean the outside of the tube and mount by wiping with a clean dry cotton cloth. Use a pointed stick or soft brush to clean the crevices in the mount. After cleaning these parts, apply a very light film of preservative-lubricating oil to prevent rust. To apply this oil, saturate a cotton flannel patch, wring it out thoroughly, and rub it over the metal outer surface of the telescope and mount. Do this daily when using your rifle under normal atmospheric conditions. Be especially careful to see that no oil touches the lens. Never remove the eyepiece or attempt to clean inside the tube.

h. Keep the exposed surface of the lenses clean and dry. Never use polishing liquids, pastes, or abrasives to clean them. When in the field, clean them as follows:

- (1) Blow on the lenses to remove loose dust particles.
- (2) Gently brush off the remaining dust with clean lens tissue paper.
- (3) Blow on the lenses to deposit moisture, then wipe them off with a piece of clean lens tissue paper. When lens tissue paper is not available, use a clean, soft handkerchief. (Even a clean handkerchief contains hard, sharp particles of

dust that will scratch the lenses; use light pressure when wiping.)

i. If oil or grease should get on the lenses, clean it off with a light application of lens-cleaning liquid soap. Then rinse the lenses and wipe them dry by rubbing gently with clean lens tissue paper. If the lens-cleaning liquid soap is not available, use ethyl alcohol. Do not apply the liquid directly to the lens or let it run between the lens and the mounting. To avoid this, hold the lens down when cleaning.

Caution: In freezing temperatures, avoid breathing on the lenses when cleaning them because the moisture from your breath condenses and freezes. Clean the lenses with ethyl alcohol.

j. In cold climates when the telescope is brought from the cold into a warm room, moisture may condense on the lenses. This moisture, if not excessive, can be removed by placing the telescope (and mount) in a warm, dry place. Do not apply heat from a strongly concentrated source. It may cause unequal expansion, breaking the optical parts or causing inaccuracies in the telescope.

Section IV. TECHNIQUE OF SNIPING

129. Aiming

The sniper aims his rifle by placing the top of the post reticle on the aiming point. There are no sights to align, but the sniper's final concentration should be on the reticle rather than the target.

130. Positions

a. The sniper fires from any position that allows him to obtain support and steadiness for himself

and his rifle. The position he chooses should embrace the following fundamentals.

- (1) Support the left hand and/or arm or the forward portion of the stock to get the steadiest sight picture possible. Do not rest the upper hand guard or the gas cylinder on a solid surface to fire. This affects the natural vibrations of the barrel and produces inaccurate shooting. The firer may support his whole body as well as his left arm and hand.
- (2) Adapt the firing position to the terrain or sniper post. The firer should use the steadiest position possible—the one in which it is possible to get the most support.
- (3) Brace the body firmly against its support and the rifle firmly against the shoulder and hold it tightly. This minimizes the effect of recoil. When he fires without the sling, the sniper must maintain a firm grip on the rifle with his right hand.
- (4) The spot weld should be the same for every shot. The sniper should learn what position of his head in relation to the eyepiece gives him the best field of view.
- (5) Relax. To complete the position, the sniper should relax. He supports the rifle by a tight grip with the right hand, and relaxes against or on whatever support he has.

b. The sniper uses the sandbag rest for all preliminary firing; in field firing, he uses whatever support is available.

131. Trigger Squeeze

a. Riflemen who have become good enough marksmen to be selected as snipers will have developed individual characteristics in applying trigger squeeze. These individual characteristics will already embody or can easily be adapted to conform to the following recommended sequence:

- (1) Locate the aiming point through the telescopic sight.
- (2) Relax enough to avoid muscular and mental tension, and inhale or exhale enough to bring the sight down or up to the aiming point.
- (3) Lock the breath in the throat as the aim is completed.
- (4) Take up trigger slack and start the squeeze.
- (5) Concentrate on the post reticle and complete the squeeze, applying pressure on the trigger straight to the rear.
- (6) As the rifle fires, follow through (still relaxed) and pick up the target or target area again through the telescope as quickly as possible. Unless the range to the target is great, the sniper cannot observe the strike; he watches instead to see if his target moves.

b. In many instances the sniper's success will be based on his ability to get off a shot quickly and he must combine some of the steps in the trigger squeeze sequence so that the shot is fired in less than a second from the time he locates the aiming area through the telescope.

132. Zeroing

a. *Zeroing the M1C Sniper Rifle.*

- (1) The M1C is zeroed like the M1. The only difference is that the sniper zeroes so that the point of aim and point of impact coincide. The M1C is zeroed at 400 yards, using a sandbag rest and a standard A target with a 3-inch square of pasters in the center of the bull's-eye. The windage knob is turned to zero. The elevation knob is set at the number corresponding to the range at which the sniper is zeroing. Zeroing should be done as described in paragraph 75, the sight being adjusted after each shot until the center of a 2-shot group is in the center of the bull's-eye. After the zero for 400 yards has been determined, the firer should calibrate the elevating knob at that range. He does this by holding the knob tightly after it is set at the correct elevation and loosening the locking nut on top. Then he can lift the elevating knob, aline the figure 4 with the index pointer, and tighten the locking nut. After the elevating knob has been calibrated, it may be turned to any setting from 100 to 900 yards and the elevation will be correct within one minute of angle. The sniper should confirm this by zeroing at 200, 300, and 600 yards.
- (2) As a field expedient, the M1C may be zeroed at 50 yards to determine the zero for 400 yards as follows:

- (a) Prepare a target by marking an aiming point on any flat surface, such as an ammunition or ration box, a tree, or a building.
- (b) Measure or pace off a range of 50 yards.
- (c) Turn the elevating knob to the 400-yard setting by alining the figure 4 with the index pointer.
- (d) Fire one shot from the sandbag rest. Examine the target. If you called the shot incorrectly or are in doubt, fire a confirming round to get a group upon which you can base a sight change.
- (e) Again examine the target. If the shot, or the shot group, is centered seven inches above the point of aim, the rifle is zeroed (approximately) for a range of 400 yards. If the shot (or group) is off this point, make the sight change necessary to move it there. At this range, one click change in elevation or windage moves the center of a shot or group one-half inch.
- (f) Fire again, confirming with a group if necessary. If your estimate was correct, this shot or group should be centered seven inches above the point of aim.
- (g) If necessary, repeat (e) and (f) above.

b. Field Expedient Zeroing. When a replacement telescope has been received or the telescope mount has been damaged and is out of line, the

following procedure may be used to assist in zeroing on a known-distance range. If the first shots do not hit the target, the sniper may fire at the four corners of the target. One of the rounds will hit the target and the sniper can use this hit to make an adjustment to start the zeroing process. When a known-distance range is not available, the zero of a new telescope can be checked or established by the following procedures.

- (1) Pick out an aiming point in the center of an area where the observer can see the strike of the bullet. This can be a hillside, a brick or stone house, or any dry surface where the strike can be observed. If possible, the range to this aiming point should be determined by map survey, from the range card of another weapon, or by measurement.
- (2) Fire one shot at the aiming point with the estimated range and windage adjustment set on the telescope.
- (3) Have the observer note the bullet strike and give the elevation and windage change necessary to bring it to the point of aim. He does this by estimating the distance of the bullet strike right or left, high or low; converts these distances to clicks of change by dividing the error in inches by the number of inches one click will move the strike at the given range.

Example: The sniper fires at a chimney on the side of a brick house at a range of 500 yards. A point on the left side of the chimney, even with a second story window, is his aiming point.

The sniper sets the elevating knob at 500 yards and the windage knob at zero and fires one shot. The observer sees a puff of brick dust about four feet to the right and about two feet low of the aiming point. He gives these corrections: "Up five clicks" (25 inches at that range), and "Left 10 clicks" (left 50 inches at that range). The sniper places these corrections on his sight and fires a confirming round.

Note. It is extremely important when zeroing or confirming a zero by this field expedient method that the shot be well-aimed and correctly fired, because the sniper is making a sight change on the one shot. He should use whatever support is available. If he feels that he has jerked the shot or if he calls it a "bad shot," he should disregard it.

c. Effect of Wind.

- (1) If the sniper zeroes his rifle on a windy day, he must take off the clicks of windage he used to compensate for the wind. For example, if he has 2 clicks right windage to compensate for a three o'clock wind, he takes it off, then zeroes the windage knob by holding it firmly and loosening the locking nut on top. Next, he lifts the windage knob and turns it to align on this alignment, he tightens the locking nut securely.
- (2) During preliminary firing, the sniper estimates the force of the wind and

makes a compensating correcting for it on his sight. During most field firing, he uses holdoff for the wind; he makes a compensating sight change only when there is a steady, predominant wind (pars. 69-71).

133. Holdoff

a. Holdoff is the procedure the sniper uses to hit a target at a range other than the one for which his rifle is zeroed. With the rifle zeroed at 400 yards, the sniper will hit his point of aim at that range. At a lesser range, he would hit above his point of aim, and at a greater range, he would hit below it. Without changing the sight setting, he can get a hit on his target by aiming under or over it. The amount of holdoff to use with M2 ball and armor-piercing ammunition is shown in figures 116, 117, and 118. It is easier to hold under than to hold over a target. When holding over it, the sight post frequently obscures it and a lateral error usually results. If the sniper is forced to hold over his target, he picks out an aiming point above it and holds on or under it. Holdoff is a field expedient to be used only when the sniper does not have time to change his sight setting.

b. The sniper may use holdoff to compensate for the effect of a wind. For field firing, he may characterize winds as either—

Medium—10 miles per hour. Leaves and grass in constant motion.

Strong—20 miles per hour. Bushes and small trees begin to sway.

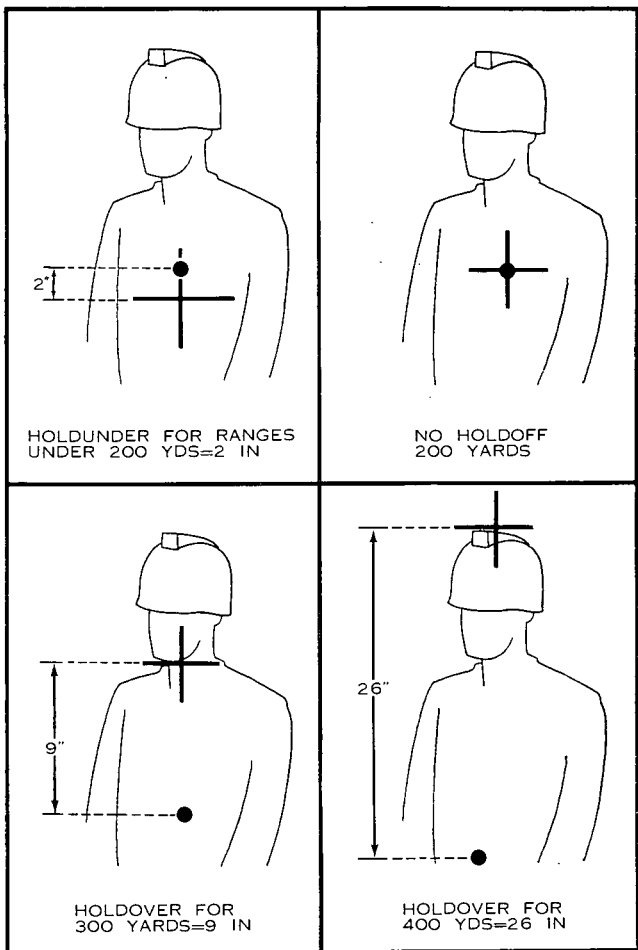


Figure 116. Holdoff distances with the telescope zeroed at 200 yards.

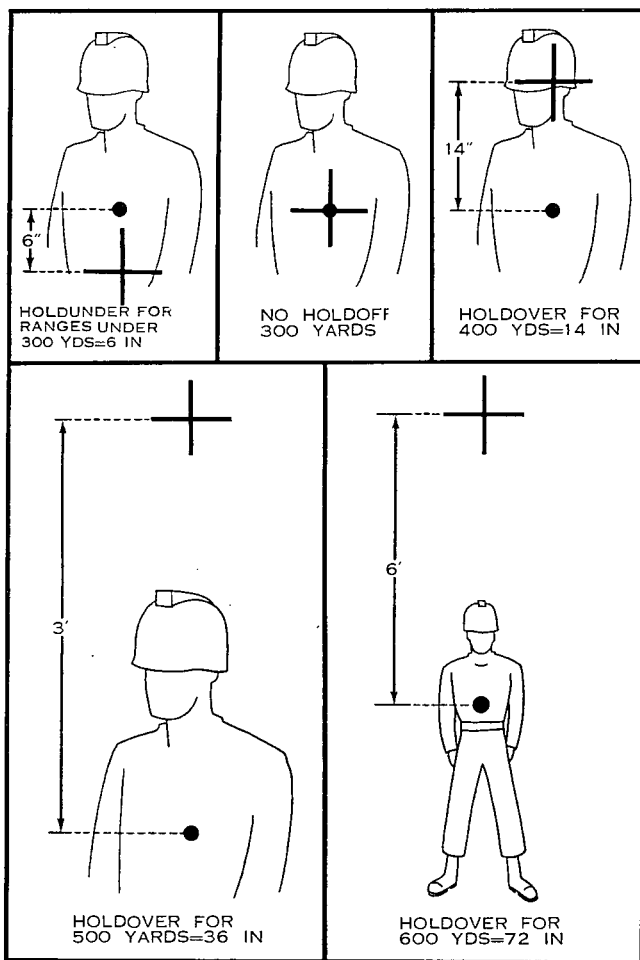


Figure 117. Holdoff distances with the telescope zeroed at 300 yards.

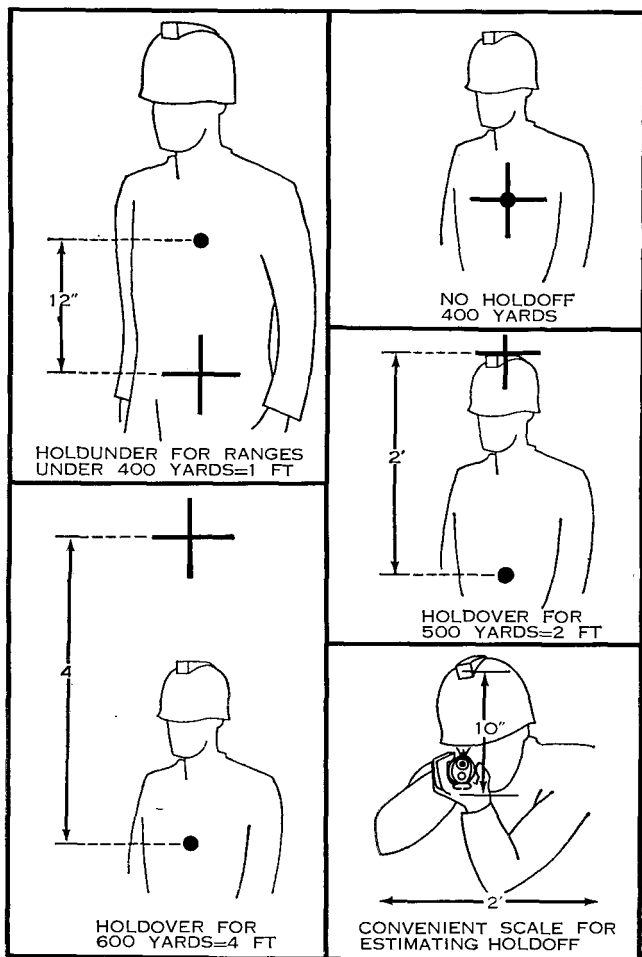


Figure 118. Holdoff distances with the telescope zeroed at 400 yards.

The sniper holds off by aiming into the wind. If the wind is from the right, he aims to the right of his target; if the wind is from the left, he aims to the left of his target. The M84 telescope sight post, which subtends an angle of three minutes, may be used as a guide when holding off. The firer may use the width of the front sight post as a measure to get the correct amount of holdoff for different ranges. The scale below shows the number of widths to be used at various ranges in a full value wind.

<i>Range</i>	<i>Number of Widths of Sight Post to Holdoff</i>	
	<i>Medium Wind</i>	<i>Strong Wind</i>
100-----	-----	-----
200-----	-----	1
300-----	1	2
400-----	1	3
500-----	2	3
600-----	2	4
700-----	2	5
800-----	3	5

Example: A sniper firing at a range of 300 yards at an enemy machine gunner, with a strong wind blowing from three o'clock, would holdoff to the right twice the width of the sight post.

c. If there is a constant wind from a given direction, the sniper may place an adjustment on his windage knob to compensate for it. He uses the same procedure described in paragraphs 69 and 70 to estimate the velocity of the wind and determine the number of clicks sight change to make to compensate for it.

d. Adjustments for wind are always based on an estimate of its velocity. Only practice in wind shooting can bring about proficiency in making sight adjustments or learning to hold off correctly.

The best way to determine the effect of wind is with a well-aimed shot at a target, if the combat situation permits. If the shot is a good one, the lateral error will be the amount to hold off or change the sights.

134. Field and Combat Firing

a. The sniper should know the zero of his rifle at all ranges. For field or combat firing, he selects one zero setting and habitually keeps it on his rifle. He selects the zero which is the most advantageous to him. It could be the zero for 200, 300, or 400 yards. In jungle combat or in dense woods where visibility limits the range, he would probably use the 200-yard zero and habitually keep this on the rifle. If he feels that most of his targets will appear at 300 yards or less, he uses the 300-yard zero. During training and, as a general rule, he uses the 400-yard sight setting as his zero. This allows him to engage targets out to 400 yards with a holdunder of no more than 12 inches.

b. If the sniper sees his target distinctly, he uses the center of mass as his aiming point. At long ranges and in some terrain, he will not be able to see his target distinctly or he may see movement only. In most cases, the enemy will be attempting to conceal himself and only the top portion of his body will be visible above the grass, small bushes, or other vegetation. When the target is indistinct, the sniper should aim at the lowest point of the visible mass. He has a better chance for getting at least a ricochet hit by aiming at the lowest portion of *what he does see*, and a

ricochet hit is better than a round wasted in thin air.

c. Although the sniper habitually keeps an appropriate zero setting on his rifle, when targets appear at a greater range he changes the elevation setting if time permits. If time does not permit, he holds over as described in paragraph 133.

Section V. PERSONNEL TO BE TRAINED AND TRAINING NOTES

135. Selection of Personnel to be Trained

The following points should be considered in selecting personnel to receive training in advanced marksmanship as a sniper.

a. With present equipment the sniper must be right-handed. The telescope is offset to the left, prohibiting its use by a left-handed shooter.

b. Perhaps the first criterion for selection is that the men selected must be good shooters. They should be the best rifle shots in the squad. Two riflemen per squad are trained as snipers. In some cases, a readjustment of personnel must be made after preliminary training to provide skilled riflemen in each squad to receive sniper training. Only one sniper rifle is provided, so the chosen men take turns acting as observer. If a choice must be made between two individuals, and everything else is equal, choose the man who does not wear glasses. There is very little that can be done to prevent light reflection on spectacles which can give away the sniper's position and, if a sniper loses or damages his glasses, he may become totally ineffective.

c. We are no longer a nation of hunters, but the sniper is just that: a hunter of the battlefield. A man with related experience, however, might make a good sniper. Such a man might be a competitive small or big-bore shooter, a varmint shooter, a forest ranger, or naturalist.

d. Physical fitness and emotional stability are prerequisites. The ability to withstand hardships and to endure long periods of waiting cannot adequately be measured, but temperament can be estimated. A patient, phlegmatic individual is better suited for the role of sniper than a high-strung, nervous man.

136. Training Notes

Army Subject Schedule 7-11 is a detailed guide for advanced rifle marksmanship, sniper training. The following additional points should be considered in planning sniper training.

a. *Level at Which Conducted.* Sniper training cannot be successfully conducted at company level, because every man must be present for every period of instruction. It should be conducted at battle group (or comparable unit) level and should be under centralized control.

b. *When to Select Personnel.* Personnel to be trained should be selected at the completion of either Trainfire I or after the firing of the combat qualification course (app. II, table III). Assuming a unit with nine squads and one sniper rifle authorized for each squad, the top eighteen riflemen should be selected for advanced training in sniping. A readjustment in personnel assignment may be required to assign two such riflemen to each squad.

c. Equipment. Every effort should be made to insure that the rifle furnished the sniper student is the most accurate available. TB 9-1275-1, 7 April 1955, may be used as a guide in the inspection of the M1C rifle. Ordnance personnel who have been trained in the procedures for making the rifle more accurate may be called upon for assistance in inspecting the equipment.

d. Camouflage Clothing; Concurrent Training. Individual camouflage clothing may be improvised from burlap or sandbags. Concurrent training is conducted in individual camouflage (FM 5-20A and FM 21-75); day and night movement (FM 21-75), and selection of sniper posts (app. II, sec. II).

e. Instruction Objectives. Every period of instruction must have an objective which the student can understand. He must know what he is expected to do better or what he is to learn by the end of each period of instruction.

f. Incentives. Competition should be injected into the training whenever possible. This may be arranged between pairs of riflemen or between the various units represented.

g. Standards of Achievement. A criterion for passing must be established for each group taking training. Variations in terrain, making one course more difficult than another, preclude the establishment of a common passing grade that can be applied to all units. In general, the sniper should be capable of a certain hit on an F silhouette target up to 200 yards, 90 percent first round hits on an E silhouette between 200 and 400 yards, and 60 percent hits on an E silhouette

between 400 and 600 yards. This standard may be surpassed. When establishing a passing score, consideration should be given to the weather, degree of visibility, and the ability of the individual at the beginning of the training period.

137. Accessory Equipment

Accessory equipment which may be made available to the sniper in combat includes the following items.

a. Infrared Equipment. The metascope and the sniperscope are aids to the snipers in locating and engaging targets at night. See FM 21-75 and ASubjScd 7-19 for the use and mechanical operation of these instruments.

b. Optical Aids. Binoculars and observation telescopes may be available for use during the training. The observer uses them to assist the sniper in locating targets.

c. Range Card (fig. 119). Snipers should prepare a range card at least once during the training. A range card is not actually an accessory since it may be prepared on any scrap of paper available. It gives the sniper a ready record of accurate ranges to various targets that appear in his sector. To prepare it, the sniper selects prominent terrain features within his assigned sector and takes a compass reading to each. He next determines and plots the range to the terrain features. He may obtain the ranges from a map survey, from another weapon in the vicinity with range finding equipment, or he may estimate them. Both the sniper and the observer familiarize themselves with the range card and the plotted

terrain features. This helps them to give target designations and ranges to targets of opportunity. In combat, the range card may be left in the sniper post for any pair of snipers who may occupy it.

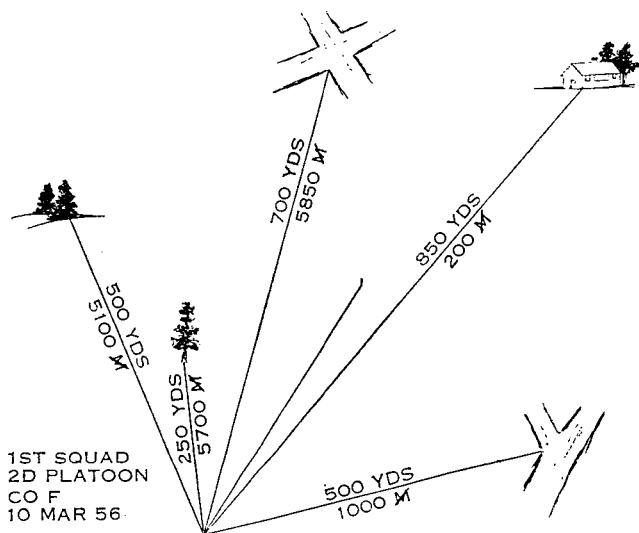


Figure 119. Sniper's range card.

PART THREE
TECHNIQUE OF RIFLE FIRE
CHAPTER 8
TECHNIQUE OF FIRE OF THE RIFLE SQUAD
(DAY)

Section I. INTRODUCTION

138. General

A fire unit is one whose fire in battle is under the immediate and effective control of its leader. The rifle squad is the basic infantry fire unit. Each squad member must be trained in standard methods of applying his fire as part of a team and must perform his assigned task automatically and effectively. Rifle squads must be trained to act as effective teams in the application and control of their collective fire. All of this training is called "technique of fire of the rifle squad."

139. Phases of Instruction

a. Instruction in the technique of rifle fire is progressive and is divided into two phases:

(1) Fundamentals.

(*a*) Range determination.

(*b*) Characteristics of rifle and automatic rifle fire.

(*c*) Application of fire.

(d) Fire control.

(2) Field target firing.

b. It is not essential to reach perfection in each fundamental before proceeding to the next. Proficiency can be attained by applying in succeeding fundamentals all that has been learned before.

c. The fundamentals of the technique of rifle fire are discussed separately in sections II-V below.

Section II. RANGE DETERMINATION

140. General

Range determination is the process of finding the distance between two points—the firer's position and his target. All squad members must know how to determine the distance from their position to the enemy so they can set their sights to the exact range and thus insure accurate fire, and so they can easily designate a target or locate a target that someone else designates.

141. Methods of Determining Range

Range can be determined by such means as measuring on maps or with ranging instruments, but in combat, the rifle squad most frequently uses estimation by eye and observation of the strike of ball or tracer ammunition.

142. Estimation by Eye

There are two ways to estimate ranges by eye: by the 100-yard mental unit of measure and by the appearance of objects. To become fully proficient, riflemen must practice both of these methods on varied terrain and under various conditions of

light and weather so they can learn how these conditions affect their estimates.

a. 100-Yard Mental Unit of Measure.

- (1) To use this method the rifleman must be able to visualize a 100-yard distance on the ground. For example, he pictures in his mind the distance between the 100- and 200-yard line on a known-distance range, or the distance from goal to goal on a football field. With these units in mind, he can mentally determine how many of these 100-yard units there are between his position and the target. In training, estimates should be checked by pacing off the distance. (The average man takes about 120 steps per 100 yards.) Constant practice is essential. This method is used for ranges up to 500 yards (fig. 120).
- (2) For ranges greater than 500 yards, the rifleman selects the halfway point to the target, estimates the range to the halfway point by applying the 100-yard mental unit of measure, then doubles the estimate (fig. 121).
- (3) Certain factors affect the appearance of 100-yard units of measure on the ground. For example, on terrain that slopes upward toward the target, 100 yards appear longer than on level terrain; on ground that slopes downward toward the target, 100 yards appear shorter than on level terrain.

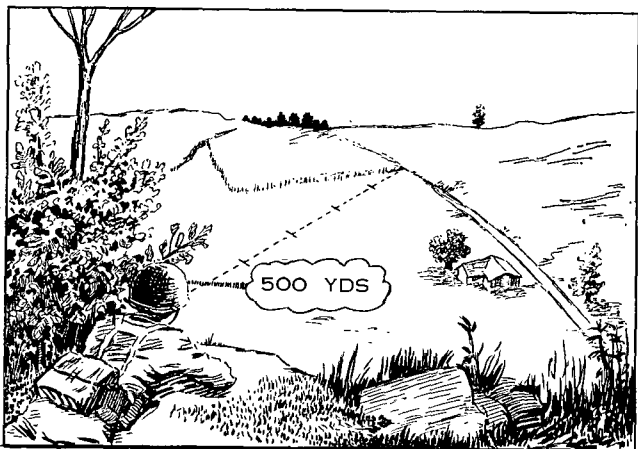


Figure 120. Applying the 100-yard mental unit of measure for ranges up to 500 yards.

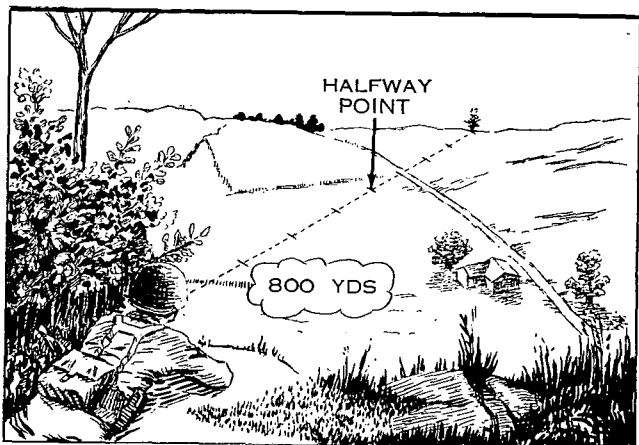


Figure 121. Applying the 100-yard mental unit of measure for ranges greater than 500 yards.

b. Appearances of Objects.

- (1) Many times the topography and vegetation will make it impossible to observe most of the terrain to the target. In this case it is impractical to apply the 100-yard mental unit of measure and ranges must be determined in another way; that is, by learning through much practice how certain objects look at 100 yards and at greater distances. For example, the rifleman studies the appearance of a man when he is standing 100 yards away. He fixes his appearance firmly in mind: his size and the details of his uniform and equipment. Next, he studies the man in the kneeling position, then in the prone position. By comparing the appearance of the man in these positions at known ranges from 100 to 500 yards, he can establish a series of mental images that will help him to determine range on unfamiliar terrain.
- (2) Training may be conducted in the appearance of other familiar objects, such as weapons and vehicles.
- (3) Certain factors affect the appearance of objects, and an understanding of them will help to make estimates more accurate. See table II.

c. Range Determination Exercises. See section III, appendix II.

Table II. Factors Affecting the Appearance of Objects

Factors to be considered in estimating range by eye	Objects <i>appear</i> nearer than they really are and ranges are underestimated	Objects <i>appear</i> more distant than they really are and ranges are overestimated
The target—its clearness of outline and details.	When most of the target is visible and offers a clear outline.	When only a small part of the target may be seen or is small in relation to its surroundings.
Nature of terrain or position of the observer.	<p>When looking across a depression, most of which is hidden from view.</p> <p>When looking downward from high ground.</p> <p>When looking down a straight open road or along a railroad track.</p> <p>When looking over uniform surfaces like water, snow, desert, or grain fields.</p>	<p>When looking across a depression, all of which is visible.</p> <p>When looking from low ground toward high ground.</p> <p>When vision is narrowly confined as in twisted streets, draws, or forest trails.</p>
Light and atmosphere-----	In bright light or when the sun is shining from behind the observer.	In poor light such as dawn and dusk, in rain, snow, or fog, or when the sun is in the observer's eyes.

When the target is in sharp contrast with the background, or is silhouetted, by reason of size, shape, or color. When seen in the clear atmosphere of high altitudes.	When the target blends into the background or terrain.
--	--

143. Determining Range by Observing the Strike of Ball or Tracer Ammunition

This is an accurate way to determine ranges and can be used when surprise is not important and when the enemy already knows he is faced with rifle fire. Since a rifleman cannot accurately observe his own fire, he needs an observer to help him. He and the observer follow this procedure:

a. The firer first estimates the range to the target by eye, sets the rear sight for that range, and fires.

b. The observer follows the path of the tracer or picks up the strike of the bullet.

c. The observer gives the firer necessary corrections in the sight setting (up or down) in clicks of elevation needed to hit the target.

d. The firer makes the sight change and continues to fire and adjust his sight until he gets a hit on target. The final sight setting to hit the target (with consideration for the zero of the rifle) indicates the range to the target.

144. Lateral Distance Measurement

a. Lateral distances are hard to estimate in feet and yards, but the rifleman needs a quick method of measuring the distance right or left from a reference point to a target, or of measuring the width of a linear target. He does this by finger-measurement. This is not a method of range determination, but only a method of determining the lateral distance in fingers between two points.

For example, a squad leader may notice in combat that an enemy machinegun is concealed in a bush that is about 200 yards away and, generally, to the squad's right front. The bush is hard to point out to his riflemen except by relating its location to some larger and easily identified object, such as a tall tree that the squad leader has designated as a reference point. Supposing that the tree is to the left of the bush, the squad leader would hold one hand at arm's length in front of his eyes and see how many fingers he needed to fill up the space between the right edge of the tree and the bush. Assuming that it took two fingers, the squad leader would tell his men to measure two fingers to the right of the tall tree to find the bush where the machinegun is hidden.

b. Here is the exact way finger measurement is applied: extend your arm, palm to the front, and lock your elbow. Close one eye and sight along the edge of your index finger, placing this edge on the flank of a target or on a reference point. Note where the opposite side of the finger strikes the target on the ground. This is one-finger measurement. If the breadth of one finger does not fill the space between the reference point and the target, hold up as many fingers as are needed to do so. Thus, you may have a one-, two-, three-, or four-finger measurement, depending upon the distance you want to measure. See figures 122 and 123.



Figure 122. Method of using finger measurement (front view).

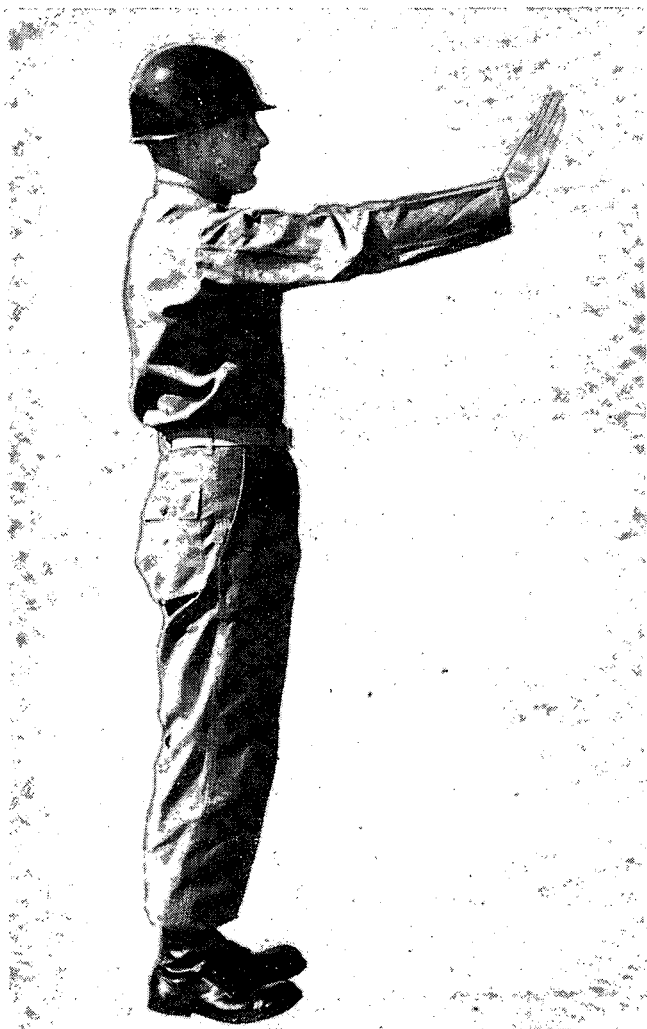


Figure 123. Method of using finger measurement (side view).

Section III. CHARACTERISTICS OF RIFLE AND AUTOMATIC RIFLE FIRE

145. General

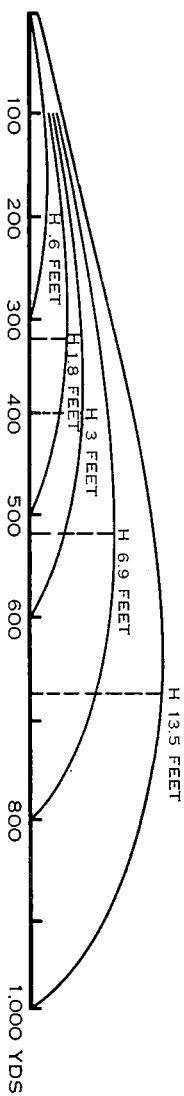
A knowledge of the characteristics of rifle and automatic rifle fire and the effect these characteristics have on the target will enable the squad leader to use his squad's fire to the best possible advantage.

146. Trajectory, Cone of Fire, and Beaten Zone

a. Trajectory.

- (1) This is the path of the bullet in its flight through the air. The great speed at which the bullet leaves the muzzle makes the trajectory almost flat at short range. As the range increases, the height of the trajectory increases. The trajectory reaches its maximum ordinate or highest point approximately two-thirds of the distance to the target (fig. 124).
- (2) The space between the rifle and the target where the trajectory does not rise above an average man's height is called the danger space. A bullet fired from ground level (prone position) at a target 750 yards away will not rise more than 68 inches above the ground, if the ground is level or slopes uniformly. A man of average height standing on the gun-target line would be hit by the bullet; therefore, the entire 750 yards is danger space. At ranges greater than 750 yards, only parts of the space between the rifle and target will be danger space

Figure 124. Trajectory.
(H = MAXIMUM ORDINATE-HIGHEST POINT OF TRAJECTORY)



because the trajectory will rise above an average man's height.

b. *Cone of Fire.* Each round fired from the rifle or automatic rifle follows a slightly different path or trajectory through the air. Because of this, the rounds form a cone-shaped figure called the cone of fire. The major factors influencing the difference in the trajectories are variations in aiming, holding, powder charge, wind, and atmosphere.

c. *Beaten Zone.* The area on the ground or the target where the cone of fire strikes, is the beaten zone. The slope of the ground affects the size and the shape of the beaten zone. Rising ground shortens it; ground sloping downward lengthens it. Ground that falls off at an angle greater than the fall of the bullets will not be hit and is called defilade. As the range to the target increases, the beaten zone becomes shorter and wider; as the range decreases, it becomes long and narrow. An understanding of beaten zone helps the rifleman and automatic rifleman to understand better the effect of their fire on certain targets.

147. Classes of Fire

Rifle and automatic rifle fire is classified with respect to the target and with respect to the ground.

- a. Fire with respect to the target (fig. 125) is—
 - (1) *Frontal* when the long axis of the beaten zone is at right angles to the front of a target in width.
 - (2) *Flanking* when delivered against the flank of the target.

- (3) *Oblique* when the long axis of the beaten zone is at an oblique to the long axis of target.
- (4) *Enfilade* when the long axis of the beaten zone coincides with the long axis of the target. Enfilade fire can be frontal or flanking and is the most effective fire with respect to the target.

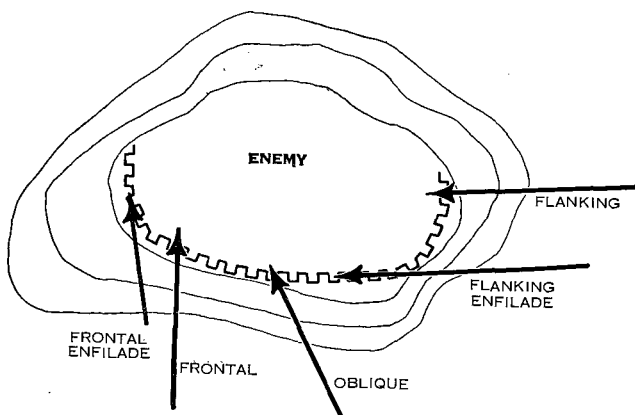


Figure 125. Classes of fire with respect to the target.

b. Fire with respect to the ground (fig. 126) is—

- (1) *Grazing* when the trajectory does not rise above the height of a standing man. Fire from the prone position may provide grazing fire up to 750 yards over level or uniformly sloping terrain. As the range increases beyond 750 yards over level or uniformly sloping terrain, the amount of grazing fire decreases (fig. 127).

- (2) *Plunging* when the angle of fall of the bullets with respect to the slope of the ground is such that the danger space is practically confined to the point of impact. Plunging fire is obtained when firing at long ranges, when firing from high ground to low ground, and when firing into abruptly rising ground (fig. 126).

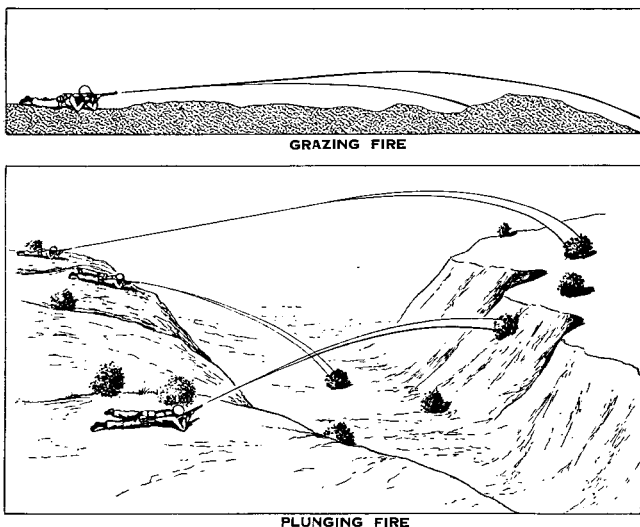


Figure 126. Classes of fire with respect to the ground.

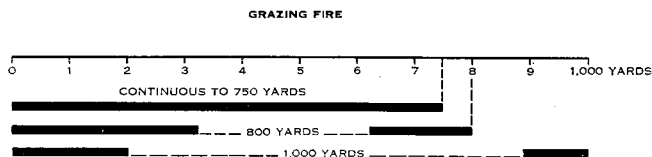


Figure 127. Grazing fire.

Section IV. APPLICATION OF FIRE

148. General

a. Application of fire concerns the way the squad applies its collective fire to make it effective on a target. To apply their fire effectively, the squad members must understand the basic techniques of engaging various types of targets and must know how squad fire is concentrated and distributed.

b. Training in the methods of applying squad fire, supplemented by actions and orders of the squad leader in any situation, insures effective application of the collective fire of the rifle squad.

149. Organization of the Rifle Squad

The rifle squad consists of the squad leader, No. 1, and two fire teams designated as Alfa and Bravo teams. Alfa team consists of a team leader, No. 2; three riflemen, Nos. 3, 4, and 6; and one automatic rifleman, No. 5. Bravo team consists of a team leader, No. 7; three riflemen, Nos. 8, 10, and 11 (No. 11 is also the squad sniper and is armed with the M1C sniper's rifle); and one automatic rifleman, No. 9.

150. Duties of the Members of the Rifle Squad

The squad leader is responsible for the training, discipline, control, and conduct of his squad. He must train all squad members to use and care for their weapons and equipment, to move and fight efficiently as individuals, and to function effectively as a part of a fighting team.

a. The automatic riflemen perform the following duties during a fire fight:

- (1) Take positions and fire on designated targets and other targets that present themselves.
- (2) Watch for ways to help the advance of the squad by using the firepower of their weapons.

b. The riflemen perform the following duties during a fire fight:

- (1) Watch for new targets and point them out to the squad and team leaders, if they do not see them.
- (2) Keep alert for orders from the squad and team leaders.
- (3) Transmit orders from the squad and team leaders to other members of the squad.
- (4) Assist the other squad members in adjusting fire on the target.
- (5) Perform the following specific duties. Nos. 6 and 8 select positions where they can assist the automatic riflemen of their respective teams. They carry extra ammunition for the automatic riflemen and are prepared to assist them by rifle fire if the automatic rifles develop a malfunction. They replace the automatic riflemen if they become casualties. No. 11 searches the target area for surprise or indistinct targets and fires on them on order or according to the squad SOP.

c. The team leader is a fighter-leader. He controls his team in the application of its fire, and he fights as a rifleman. The senior team leader

also assumes command of the squad in the absence of the squad leader.

151. Marksmanship

In known-distance firing, the rifleman learns how to use his weapon effectively. He must remember *and use* the techniques he learns in this training. In combat, his targets will be varied. Some will be entirely visible, others only partly visible; some will be moving, others stationary. This increases the importance of accurate sight alinement and, with moving targets, accurate leads.

a. Aiming Point. Many times the rifleman will not have time to make sight changes during combat. He will have to use the battle sight and adjust his point of aim on the target. Thus, when firing at a standing man at ranges up to 400 yards, he should aim at the center of mass (about belt level to heart level (fig. 128)). This center of mass aiming point is used whether the enemy soldier is standing still or moving directly toward or away from the rifleman. A rifleman will rarely engage an enemy soldier at a range greater than 400 yards, but if he does, he should take time to set his sight for the range, then use the same aiming point. He must remember to use the aiming techniques he learned in combat position firing.

b. Leads. When engaging a target that is moving laterally to his firing position, the rifleman must aim far enough in advance of the target's center of mass so that the bullet and moving target meet.

**USING BATTLE SIGHT (300 YDS)
AGAINST PERSONNEL**

400 YDS OR LESS
AIM HERE



Figure 128. Aiming point.

- (1) To lead a walking man at ranges less than 300 yards, he aims at the forward edge of his body; at ranges over 300 yards, he leads him by the width of his body, which is one lead (fig. 129). If the man is running, these leads are doubled.
- (2) A rifleman can hit most moving vehicles that appear on the battlefield by aiming and firing at the leading edge.

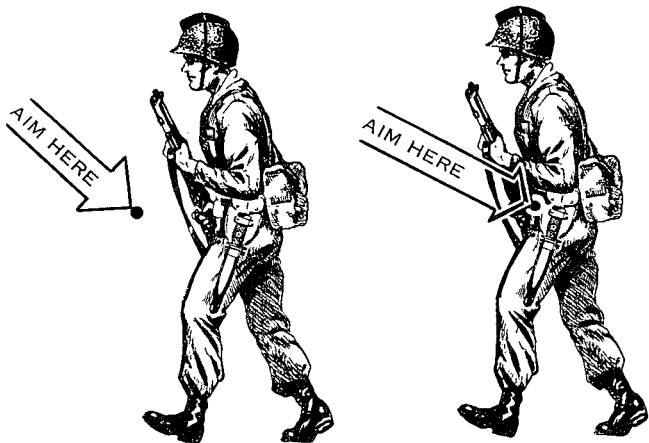
152. Methods of Applying Squad Fire

In combat, the size and nature of a target may call for the firepower of the entire squad or only part of it. The fire may be directed at a point or distributed along a line or over an area.

a. Concentrated fire is a heavy volume of fire

OVER 300 YDS

300 YDS OR LESS



DOUBLE LEADS FOR RUNNING MAN

Figure 129. Leads.

directed at a point target such as an automatic weapon or enemy concentration.

b. Distributed fire is fire that is distributed in width or depth so that a wide or deep target can be effectively covered.

(1) *Distribution of fire on a target of width.*

The squad leader designates the center and the flanks of a wide target. He usually assigns each fire team half of it (fig. 130), but the terrain may dictate that one team cover a larger portion than the other. The normal deployment from the squad's combat formation places the Alfa team on the right and the Bravo team on the left. Each

automatic rifleman covers the entire width of his team's target, making sure to overlap its flanks. Each rifleman covers his team's target in the following manner (fig. 131). Initially, the left flank rifleman covers the left portion, the center rifleman covers the center portion, and the right flank rifleman covers the right portion. After covering all known or suspected enemy locations in his own portion of the team's target, the rifleman fires at known or suspected enemy locations throughout the team's target. When the team leader fires he covers his entire team target. He must frequently check with the squad leader for signals and instructions, and is responsible for adjusting his team's fire or shifting it, if necessary, to any portion of the squad's target. The squad sniper fires his assigned portion of the target and, in addition, is responsible for engaging targets of opportunity. Also, he may be used by the squad leader for specific jobs. If the squad leader gives him a separate mission while the squad is engaging a wide target, the Bravo team leader covers the sniper's portion of the target or shifts the fire of his riflemen to cover it.

- (2) *Distribution of fire on a target of depth.* The squad leader designates the center, front, and rear of the target. He may assign one fire team to cover the front

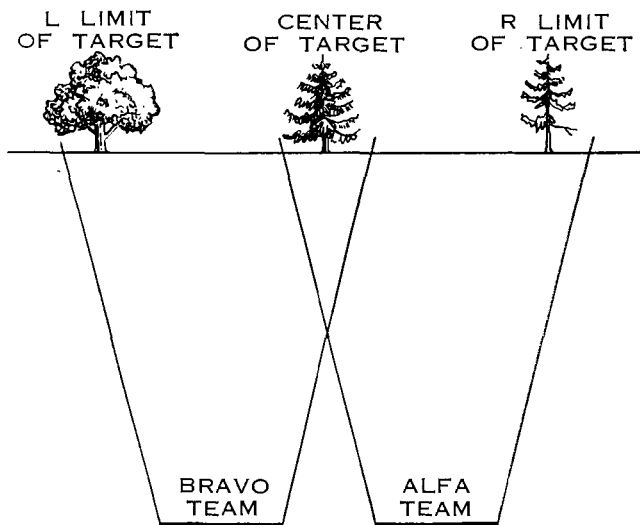


Figure 130. Team distribution of fire on a wide target.

half and the other fire team the rear half, basing the assignment, usually, on the terrain and the location of the target.

- (3) *Distribution of fire during fire and maneuver.* When the squad advances by fire and maneuver, the squad leader designates one of the teams as the maneuver element and the other as the fire support element. The team designated as the fire support must cover all of a target of depth or width while the maneuver element advances. The squad leader may change the composition of his two teams, if he feels it is necessary. For example, he may use both AR's in

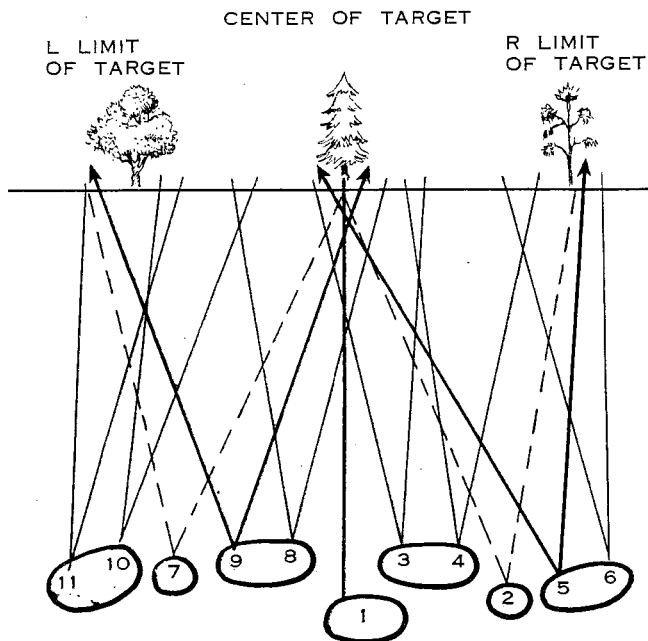


Figure 131. Initial individual distribution of fire on a wide target.

the team that is the fire support element. During the advance to the objective, members of the maneuver element may have to rush individually, supported by the fires of other members.

c. Area Fire. Area fire is fire distributed in depth as well as width. It is effective in smothering and neutralizing an area. It is used when the enemy is known to be in a certain area, but his specific location cannot be observed. Each rifleman fires his sector in depth and width, firing at the suspected enemy locations. The auto-

matic riflemen distribute their fire on likely targets in the team sector.

d. Assault Fire. Assault fire is a violent and heavy volume of fire by assault elements as they close with the enemy. Its purpose is not only to kill or wound the enemy, but to terrify and demoralize him. It keeps him deep in his hole where the shock effect of the supporting fires puts him—hugging the ground with his weapon idle—or it forces him into a hurried and disorderly retreat. When attacking troops reach the assault phase, they are normally deployed as skirmishers and advance at a rapid walk toward the objective. The riflemen, with bayonets fixed, deliver a heavy volume of fire by firing well-aimed shots from the shoulder every two or three steps until they are within 30 or 35 yards of the objective. As soon as they get this close to the objective, they shift to the underarm position and fire well-directed shots at suspected enemy locations as well as at observed enemy soldiers. The automatic riflemen carry their weapons slung from the left shoulder and fire from the crouch position. The automatic rifle is a difficult weapon to operate during the assault. The gunner must have a thorough knowledge of and repeated practice in the techniques of its operation (FM 23-15). By fastening two slings together and looping one end on the stock, with the other end passing over the carrying handle to the upper sling swivel, the weapon will hang in the firing position while the gunner uses both hands to reload. He should carry his magazines in his ammunition belt with the open end down and the

long side to the rear. This makes them easy to remove from the belt and place in the receiver. In removing an empty magazine from the weapon, the gunner presses the magazine release with the thumb of one hand and removes the magazine with his other hand. He places the empty magazines in his shirt or in an ammunition bag. He must keep the magazines because they are a part of the weapon, and it will not fire automatically without them. In the assault, the automatic rifleman fires a burst every two or three steps as his left foot strikes the ground, and reloads while moving steadily forward. The squad leader moves at the rear of the squad to enforce the continuity of fires and to control squad alinement. Team leaders move initially just to the rear of the squad to assist in control but, as the assault progresses, they may move up on line and participate in the assault firing.

e. Rate of Fire. The maximum effective rate at which any rifleman can fire an M1 is determined by his ability to aline the sights and squeeze the trigger. To fire in excess of his accurate fire rate is a waste of ammunition. The maximum effective rate of fire for the automatic rifle is 120 to 150 rounds per minute. The sustained rate of fire is 40 to 60 rounds per minute. The sustained rate must be used when the weapon is in operation for long periods, to keep the barrel from overheating. Both the riflemen and automatic riflemen should fire their first few rounds, particularly in the case of surprise fire, at the maximum effective rate in order to gain fire superiority. Thereafter, the rate should be decreased to

the point that will maintain fire superiority. This is done either on command of the squad leader or by SOP.

Section V. FIRE CONTROL

153. General

To be effective, the squad's collective fire must neutralize enemy fire. Enemy troops are trained in the use of cover and concealment, therefore targets will be well-disposed and indistinct, if not entirely invisible. The squad leader must strive for complete control, if the squad is to locate and engage these targets. Fire control depends on the ability of the squad leader to move his men from one firing position to another and have them open fire, shift fire, and cease fire advantageously. To do this, he must gain their attention and be able to put into practice the following methods of fire control. Remember that control is primarily accomplished by teamwork.

154. Methods of Fire Control

The squad leader must realize the limitations of each of the methods discussed below and, in any given situation, select the one that will get the job done the best.

a. Oral. This is a good, fast method of control, but many times the leader is too far from his squad members and the noise of battle is too great for him to be heard.

b. Arm and Hand Signals. All squad members should understand the standard signals (FM 7-10). This is a quick method of control when the members of the squad can see the leader.

c. *Other Prearranged Signals.* These may be either visual or sound signals, such as pyrotechnics or blasts on a whistle. Every man in the squad must clearly understand the meaning of every prearranged signal.

d. *Passing Orders From Man to Man.* Simple orders may be passed from one man to the other successfully. The squad leader should not try to pass complicated orders down the line because they can very easily become confused, and they may require too much time when speed is of particular importance.

e. *Personal Contact.* The squad leader will find himself in many situations where he must move to individual squad members to get his orders across. This aggressive method of control is probably used more than any other by small unit leaders. The squad leader must use maximum cover and concealment to keep the positions of his men from being observed by the enemy as he moves from man to man.

f. *Use of the Team Leader.* The squad leader must use his team leaders to the utmost. He gives them specific responsibilities prior to combat, as well as spur-of-the-moment instructions to help with the difficult job of controlling their men.

155. Elements of the Fire Command

The squad leader must know just what orders are necessary to place effective fire on various targets. Fire commands for all weapons follow a pattern that includes similar elements. In combat, fire commands for the rifle squad tend to be informal, but there are six essential ele-

ments which must be given or implied to the squad by one or more of the methods of control. These elements are—

Alert

Direction

Target description

Range

Method of fire

Command to open fire.

a. Alert. This element brings the necessary men to a state of readiness to receive further information. The squad leader may alert the entire squad or any part of it, depending on the situation. Usually he alerts his entire squad, even though he may not command all members to fire initially. He can give the alert orally with the command SQUAD or AR's, or RIFLEMEN, or by calling the men's names or squad number or team. He may also give the alert by signals, personal contact, or any other of the control methods.

b. Direction. This element indicates the general direction to the target and, in some cases, may pinpoint the exact location of point targets, flanks, or the center of wide and deep targets. The element may be given in one or a combination of the following ways:

- (1) *Orally.* The squad leader's spoken announcement should indicate the relationship between the target location and the squad location, as shown in figure 132.
- (2) *Pointing.* The squad leader can point to the target with his arm or rifle. When he points with his arm, a man

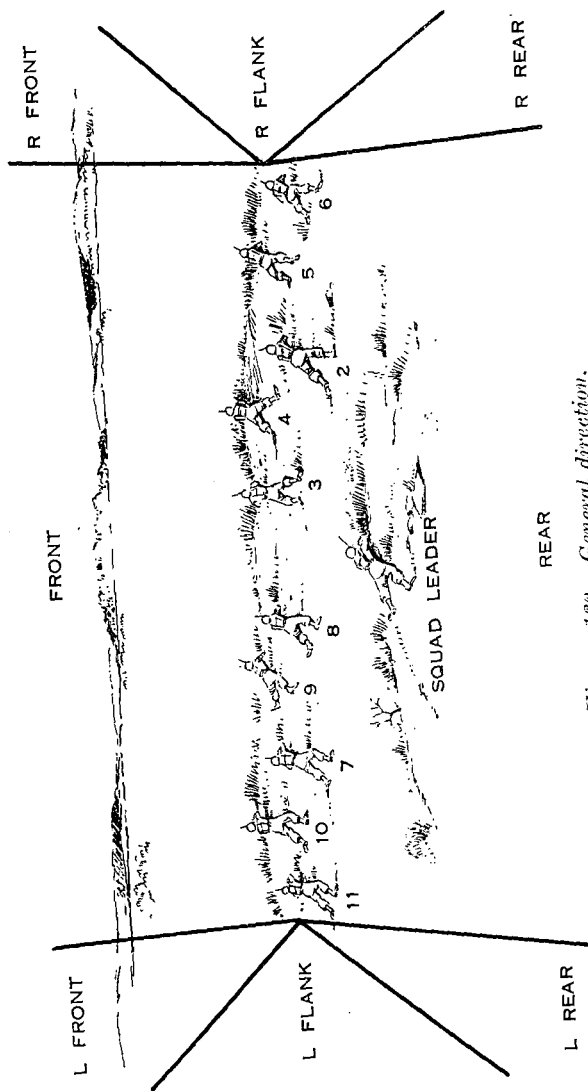


Figure 132. General direction.

standing behind him should be able to look over his shoulder and sight along his arm and index finger. In pointing with the rifle, the squad leader puts it to his shoulder, cants it to the right, and aims at the target. Then he moves his head away without disturbing the rifle so any of his men can look through the rear sight and locate the target. He may also place the rifle on a rest, pointing at the target. He can use a bayonet stuck into the ground at an angle so that the weapon rests in the V formed by the bayonet hand guard and the bayonet handle. A tree fork or a log can also be used as a rest, and the automatic rifle can be used with its bipod. A number of men can then look through the sights and locate the target.

- (3) *Use of tracer ammunition.* Tracer ammunition is a quick and sure method of indicating the direction to an indistinct target and is most accurate for pinpointing the flanks of an obscure target. When using this method, the squad leader should first give the general direction orally to direct the squad's attention to the desired area. For example:

SQUAD

FRONT—WATCH MY TRACER

(fires 1st round)—RIGHT FLANK

(fires 2d round)—LEFT FLANK.

Firing tracer ammunition to designated

targets has these disadvantages: it may disclose the squad's presence and position and reduce the surprise effect of the squad's fire.

- (4) *Reference points.* To help the members of the squad locate an invisible or indistinct target, the leader can use an easily recognizable reference point that is nearby. Prominent landmarks and terrain features make good reference points. The squad leader must be familiar with the terrain features and the terminology used to describe them (FM 21-26). When using a reference point, the word REFERENCE precedes its description and the word TARGET precedes the target description. This prevents the squad from confusing the two. Here are some examples of the use of reference points:

NUMBER 11

FRONT

REFERENCE: Dead tree in draw.

TARGET: Sniper.

NUMBERS 5 and 9

LEFT FRONT

REFERENCE: Truck in barnyard,
at a lesser range.

TARGET: Machinegun.

BRAVO TEAM

RIGHT FRONT

REFERENCE: Crossroads, right to
grassy mound.

TARGET: Patrol.

When using a reference point, always give the general direction to it and the range to the target. Sometimes you can best designate a target by using successive reference points; for example—

SQUAD

LEFT FRONT

REFERENCE: Stone house, right to small barn, right to haystack.

TARGET: Machinegun.

Finger measurement (par. 144) can be used to direct the squad's attention to right or left of a reference point; for example—

SQUAD

FRONT

REFERENCE: Lone pine tree, right two fingers.

TARGET: Machinegun.

c. Target Description. The squad members must know what type target they are to engage if they are to apply their fire properly, so the leader should describe it briefly, but accurately. He always states the general formation of enemy troops that he designates as a target, such as **COLUMN** or **LINE OF RIFLEMEN**. Finger measurement can be used to designate the width of a wide target when the flanks cannot be pinpointed. When the squad leader is sure the target is obvious to all his men, he need not describe it orally.

d. Range. Range tells the men how far to look to locate the target and gives the informa-

tion necessary to make sight changes and to adjust the point of aim when using the battle sight. The range is given in yards, but the words RANGE and YARDS are not used. Even hundreds of yards are expressed in hundreds, as ONE HUNDRED, TWO HUNDRED, etc.; otherwise, range must be expressed digit by digit such as, TWO TWO FIVE or FOUR SEVEN FIVE. Range is not given in less than 25-yard increments. It may be given by hand signals (holding up two fingers can indicate 200 yards), and it may be omitted when all men can obviously determine the range for themselves.

e. Method of Fire. This element tells which members of the squad are to fire at the target. If the squad leader wants the same men to fire that he alerted, it may be omitted. He can give this information using any method that he might use to alert them. If any ammunition allotment is necessary, it is also announced in this step; for example—

SQUAD
FRONT
AUTOMATIC WEAPON
THREE HUNDRED
5 and 9, 2 MAGAZINES.

f. Command to Open Fire. The squad may be required to open fire on command or signal. If surprise fire is not required, the command FIRE is given without a pause after the last element. If the squad leader wants all the men to open fire at once for surprise and shock effect, he precedes the command or signal to fire with

the words AT MY COMMAND or AT MY SIGNAL. When all the men are ready, he commands or signals, FIRE; for example—

SQUAD
FRONT
AUTOMATIC WEAPON
THREE HUNDRED
5 and 9, 1 MAGAZINE
AT MY COMMAND
FIRE.

156. Example of Oral Fire Commands

It is not realistic to expect that the squad leader's commands in combat will be as formal as those shown below. He may be able to use them in some situations when time and conditions permit. Nevertheless, they are of the utmost importance in a squad's early training to ingrain in the squad members the essential elements needed to get fire on a target and to instill in them the habit of seeking and reacting to them.

a. In the following example the squad leader desires to place the fire of his entire squad on an easily recognized target:

SQUAD
FRONT
LINE OF RIFLEMEN
FOUR HUNDRED
FIRE.

b. In the example below, the squad leader desires to designate the target to his entire squad but wants only the automatic riflemen to engage it. The target is indistinct. Note the use of a reference point:

SQUAD

LEFT FRONT

REFERENCE: Red barn, right two fingers.

TARGET: Automatic weapon.

FOUR FIVE ZERO

5 and 9

FIRE.

c. Assume that the squad is engaging a target and that the squad leader wants to shift the fire of the riflemen to a new target. He decides not to interrupt the firing of the automatic riflemen, so he gives this command:

RIFLEMEN

LEFT FLANK

REFERENCE: Road junction.

TARGET: Line of riflemen extending right two fingers.

THREE FIVE ZERO

FIRE.

157. Examples of Other Fire Commands

The following examples show the use of different methods of control. Some of the elements are implied. Because of the situation, these commands are informal, but they are very effective.

a. In the following example, the squad leader desires to place the fire of an entire squad on an automatic weapon that has opened fire on the squad from about 300 yards.

Squad leader commands, WATCH MY FIRE.

Squad leader engages target.

Squad leader commands, FIRE!

b. In the example below the squad leader de-

sires to have the No. 11 man engage an enemy rifleman exposed to the squad's front.

Squad leader throws rock at No. 11.

No. 11 looks at squad leader.

Squad leader points to target and commands or signals, **FOUR HUNDRED**

No. 11 acknowledges target, aims, and fires.

c. Assume that the squad is engaging a target and that the squad leader wants to shift the fire of the automatic riflemen onto a new target without interrupting the riflemen's fire.

The squad leader calls to the Bravo team leader, signals that the automatic rifleman is to fire, and points to the new target.

The team leader acknowledges the signal and has No. 9 automatic rifleman engage the target.

The squad leader moves to No. 5 automatic rifleman, points out the new target, and commands, **FIRE!**

d. The squad leader wants to place the fire of No. 11 and No. 8 on two enemy riflemen running toward a ditch to the front.

Squad leader commands—**EIGHT AND ELEVEN—THOSE MEN, FIRE!**

e. The squad leader wants the squad to engage an area target.

The squad leader commands, **WATCH MY FIRE.**

He marks the flanks and depth of the target by firing tracer ammunition.

He commands, **FIRE!**

158. Standing Operating Procedures

Standing operating procedures are rules for actions that the squad does automatically without

command. The SOP's that the squad learns in training and that the squad leader sets up simplify the leader's job of control and eliminate the necessity for many commands. They may be used to handle many routine situations, such as the action the squad takes when it is subjected to surprise fire and the actions that certain individuals perform during a fire fight. One primary SOP the rifle squad should always use is the SEARCH—FIRE—CHECK SOP. Following the SOP, the squad members search their assigned portions of the squad sector. When a target appears somewhere in the squad sector, each man engages it as explained in paragraph 152. While firing, a rifleman must frequently glance at his fire team leader for instructions; the fire team leaders also check frequently with the squad leader. Many other matters, such as signals and administrative details, can be included in an SOP. The ultimate would be to have the squad act automatically in all situations. This, of course, is impossible, but the squad can approach it by intense training and by developing SOP's to take care of as many situations as possible.

Section VI. FIELD TARGET FIRING

159. Introduction

The second phase in technique of rifle fire training requires the application of all the fundamentals learned in the first phase. The squad works as a unit, and gains the advantage of firing under realistic situations. In field target firing, the squad moves from a combat formation into

firing positions to engage various types of simulated enemy targets.

160. Review of Important Fundamentals

Although the squad must call on all its prior training in the technique of rifle fire to conduct field target problems successfully, there are two fundamentals that must be used to the utmost. They are *application of fire* (pars. 148-152) and *fire control* (pars. 153-158). The riflemen must understand them and know the techniques they involve to insure effective squad fire. These two fundamentals and the method of searching terrain by observation (FM 21-75) should be reviewed thoroughly before firing field target problems. In addition, the importance of teamwork should be stressed throughout this training.

161. Types of Problems

The problems are varied and the squad should repeat each type until it becomes proficient in it. The targets should be arranged so that the squad can practice control and application of fire on the following types singly and in combination: a line of riflemen, a column, an oblique target, an area target, an automatic weapon's position, and various single targets of opportunity such as a sniper or moving target. Situations should be developed which require the squad to deliver surprise fire and to engage several targets simultaneously. For sample situations, see section IV, appendix II.

162. Range Organization and Operation

a. General Characteristics. Figure 133 shows a schematic diagram and the desirable dimensions

of a field target firing range. The firing line should be slightly irregular and contain folds in the ground and stumps and brush or other features that offer cover and concealment and good firing positions. The firing line should be about 300 yards wide so the squad leader can select different positions for different type problems. Four pits are enough to give a wide variety of targets. Personnel pits are staggered so as not to mask each other. Varied terrain is desired so

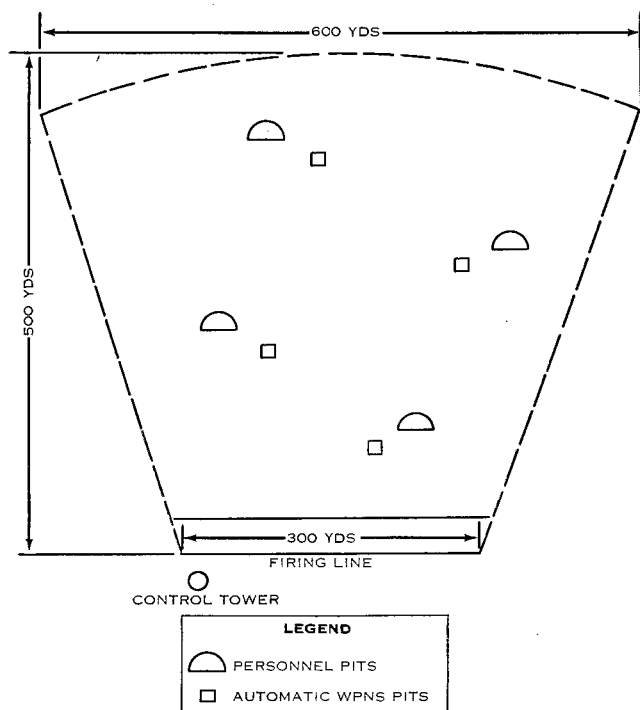


Figure 133. Field target range.

that the fire will tend to be plunging and the squad members can observe and adjust their fire.

b. Targets. E, F, and M type silhouettes are used to represent the enemy. They may be arranged to represent a line of riflemen, a column, a machinegun crew, and single targets of opportunity. They can be placed in groups of 9 to 12 to make good columnar or linear targets, and a group of 5 can represent a machinegun crew. Machineguns placed in pits (fig. 134) and loaded with ball ammunition can be fired from personnel pits to add realism to the problems. When this is done, the targets representing crew members should be placed around the machinegun pits in an area approximately 15 yards square. Some of the targets should be camouflaged to fully test the squad's ability to properly distribute fire. Targets of opportunity can be constructed as shown in figures 135 and 136. These targets should be camouflaged as appropriate.

c. Range Control. All personnel pits should have telephone communication with a control point back of the firing line. The control operator can then have the pit operators present the targets at the desired time.

d. Ammunition. Ammunition is allocated on the basis of six clips for each rifleman and seven magazines for each automatic rifleman. The amount suggested permits the squad to deliver a good volume of fire for four or five minutes.

e. Safety Precautions. See paragraph 5, appendix III.

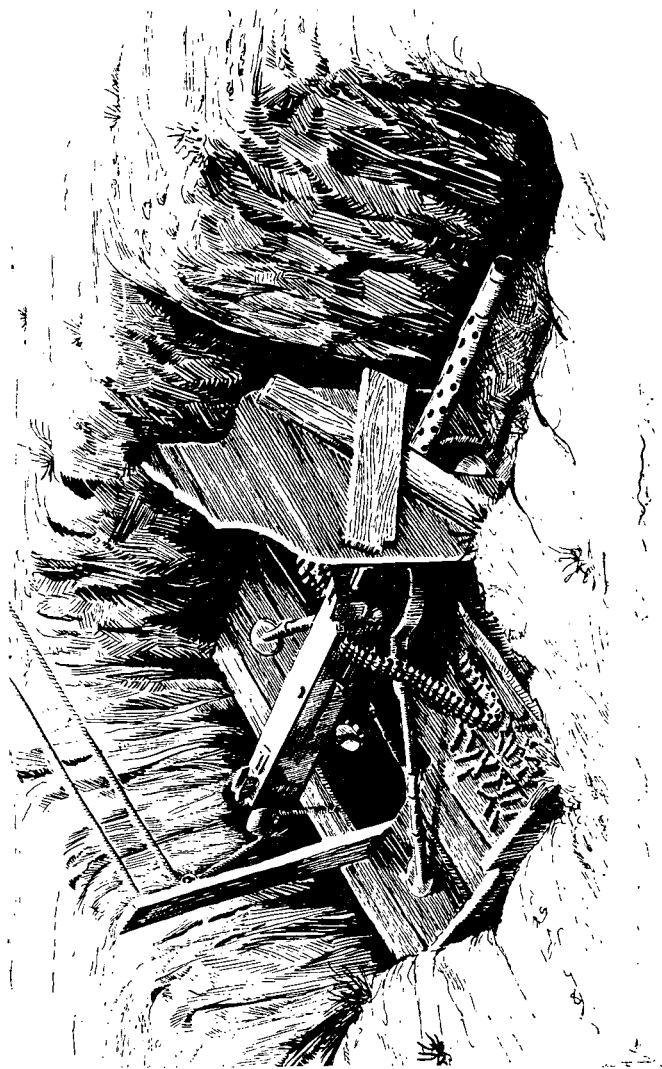


Figure 194. Details showing a method of installing a light machinegun to produce a sound effect, fired by a cable from a personnel pit.

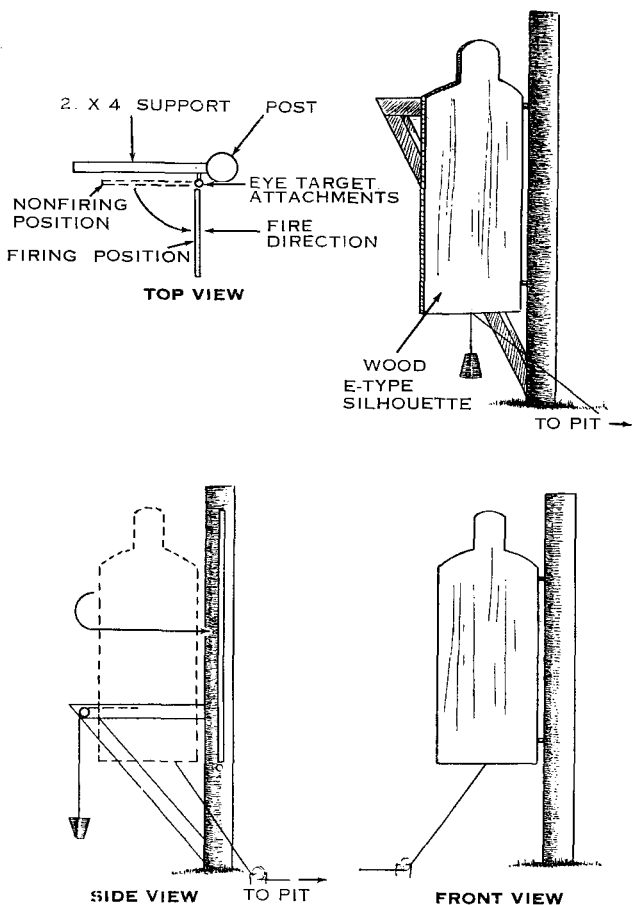


Figure 135. Sniper target, controlled in personnel pit.

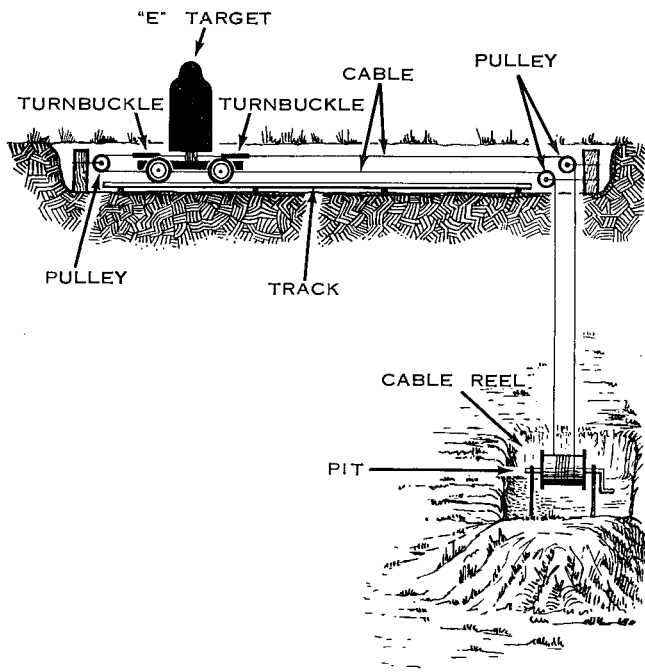


Figure 136. Moving target.

163. Conduct of Training

a. Field Target Firing Problem. The instructor should precede field target firing with an oral review of marksmanship, the fundamentals of the technique of rifle fire, cover and concealment, selection of firing positions, and combat formations. He then issues the squad its ammunition in an assembly area and tells the men the purpose of the problem and the situation. The squad leader issues his orders to the squad, then moves

it forward in combat formation. At some point in this movement, the enemy fires on the squad which quickly deploys, the men taking up firing positions and engaging the target. During the fire fight, other targets such as automatic weapons and targets of opportunity are presented. The squad must employ all of its knowledge of the technique of rifle fire to locate and engage all targets effectively. The problem should last about five minutes, then on the instructor's signal, the squad leader gives the command to cease fire. After all weapons are cleared, the squad assembles for a critique.

b. Integrated Training. Field target problems are designed primarily to test the techniques learned from training in the technique of rifle fire, but other phases of training should be integrated and tested also.

- (1) *Marksmanship training.* The squad must apply all the techniques learned in rifle and automatic rifle marksmanship training. Common sense should be used in applying these techniques, and they should be modified to get the most from them. For example, rocks, logs, and other objects should be used as a rest for weapons to make the fire more accurate. The 300-yard battle sight (par. 97) should be used throughout the field firing exercises. To simulate actual combat conditions, bayonets should be fixed for some of the problems and the grenade launcher should be attached for others. A weapon's zero may change

when the bayonet is fixed or the launcher is attached, so it should be checked or redetermined.

- (2) *Combat formations.* Many of the problems require the squad to move to the firing positions in a particular combat formation. Formations (FM 7-10) should be reviewed and applied accordingly.
- (3) *Cover and concealment.* All prior training in the use of cover and concealment (FM 21-75) should be applied in running the problems.

c. Problem Scoring. Any scoring system which gives credit for accuracy and fire distribution may be used. For example, five points may be given for each silhouette that is hit, plus one point for each hit (not to exceed five) in that silhouette. Therefore, the maximum score for any one target cannot exceed 10 points (five hits). This discourages the squad from firing on only one or two silhouettes and gives it an incentive for properly distributing its fire over the whole target. The highest possible score for any given problem depends on the number of silhouettes used. (For example, if 15 targets are used, the possible score would be 150.) The score is announced at the end of the problem. It represents only a portion of the squad's performance; the squad's rating on the items covered in *d* below are equally important.

d. Problem Critique. At the completion of each problem, the instructor restates the purpose of the problem and conducts a critique. The

points covered include the fundamentals of the technique of rifle fire training and other integrated training as suggested in the following:

- (1) Orders of the squad leader.
 - (a) Instructions in preparation for action—check of equipment, ammunition, duties of individuals, and special instructions.
 - (b) Orders for and during the action. Initial and subsequent orders.
- (2) Selection of combat formation.
- (3) Actions of individuals.
 - (a) Selection of firing positions.
 - (b) Use of cover and concealment.
 - (c) Individual initiative.
 - (d) Fire discipline.
 - (e) Compliance with orders.
- (4) Rate of fire.
 - (a) Initially rapid to pin enemy to the ground.
 - (b) Controlled to insure maximum effect of fire and conservation of ammunition.
- (5) Fire control.
 - (a) Orders and SOP's.
 - (b) Signals.
 - (c) Use of fire team leaders.
- (6) Application of fire.
 - (a) Concentration of fire.
 - (b) Distribution of fire.
- (7) Effect of fire.
 - (a) Proper distribution.
 - (b) Accuracy.
 - (c) Score.

Section VII. LANDSCAPE TARGET FIRING

164. Introduction

a. Landscape target firing may be conducted as a substitute for field target firing when field firing ranges are not available, as may be the case with reserve type units. If field target firing can be conducted, it is not necessary to conduct landscape target firing.

b. Landscape target firing is conducted on a 1,000-inch range with a target that shows the picture of a landscape as it might appear to a squad in combat.

c. Landscape target firing offers these advantages:

- (1) It permits close supervision of all members of the firing unit.
- (2) It clearly and quickly demonstrates the application of fire.
- (3) The training can be accomplished in a limited area and without the need of personnel to operate targets and special equipment.
- (4) It can be conducted indoors when lack of outdoor facilities or the weather makes it desirable.
- (5) It gives the squad leader practice in issuing oral fire commands.

165. Description of Landscape Target

a. General. A landscape target is a panoramic picture of a landscape drawn so that all or nearly all of the prominent terrain features are recognizable at a distance of 1,000 inches. The stand-

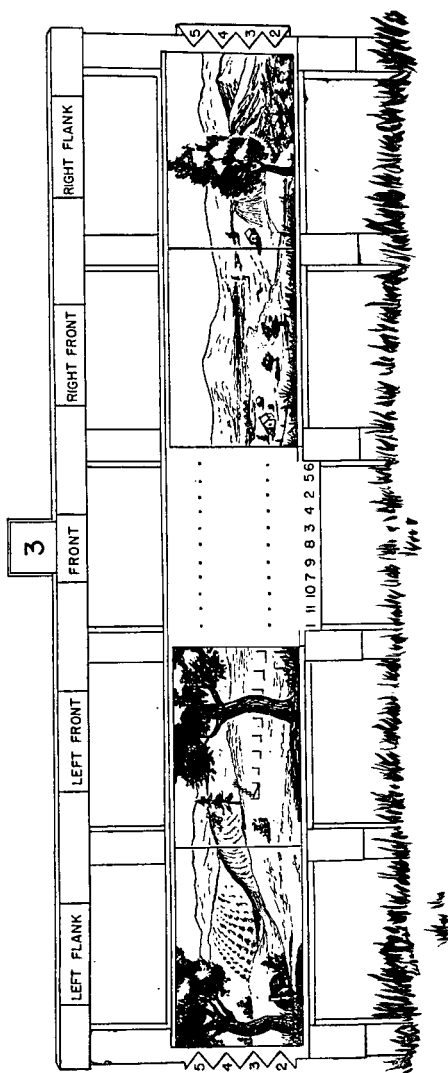


Figure 137. A landscape target.

ard target is the series A of ten sheets in black and white which are pasted to form five panels.

b. Range Indicator. Pointed wooden indicators are painted with numbers representing yards of assumed range and fastened along one or both sides of the series of panels. This makes it easier for the squad leader to designate a target on the picture and for the firers to locate it. Remember that any range announced is only simulated, so the 1,000-inch zero sight setting must not be changed.

c. Direction Indicators. Wooden blocks, painted with the words FRONT, RIGHT FRONT, LEFT FRONT, RIGHT FLANK, and LEFT FLANK are fastened above the appropriate panels of the landscape series. They correspond to the direction elements the squad leader uses in oral fire commands.

166. Weapons for Landscape Target Firing

The .22 caliber rifle must be used for indoor landscape target firing. The M1 rifle, the automatic rifle, or the .22 caliber rifle may be used outdoors.

167. Scoring and Scoring Devices

a. Point Targets. A suitable template for scoring point targets can be made from celluloid, cardboard, or similar material. The inner rectangle of the template should be $2\frac{1}{2}$ inches high by 2 inches wide, while the outer rectangle should be 5 inches high by 4 inches wide. The template is shown in the insert in figure 138. Experience shows that in firing at a point target at a range of 1,000 inches, 50 percent of all rounds fired will

hit in an area that can be covered by a 2- x 2½-inch rectangle. An additional 25 percent, making a total of 75 percent of the total rounds fired, normally will hit this target in an area that can be covered by a 4- x 5-inch rectangle. The remaining 25 percent of the total rounds fired will normally hit outside the 4- x 5-inch target area. The inner rectangle is known as the 2-point zone, and the outer rectangle as the 1-point zone. Each hit in the 2-point zone counts 2 points, and each hit in the 1-point zone counts 1 point. Hits cutting or touching a line count where they have the most value. The template is placed on the panel with the center of the target exactly centered within the 2-point zone. The scoring space is then outlined with pencil (fig. 138), but lightly, so the marks cannot be seen from the firing line. The scoring space is marked before the problems are fired to avoid any question that the template is placed on the shot group so as to show a maximum score. All problems are fired on the basis of 50 rounds per problem. The highest possible score for any problem is 100.

b. Linear Targets. A template for scoring linear targets can be made from the same type material as that recommended for the point target template. The insert on figure 139 shows a drawing of the template outline. The 2-point zone consists of 2 lines drawn 2½ inches apart, parallel to the long axis of the target. Two additional lines, drawn 5 inches apart above and below the 2-point zone, constitute the 1-point zone. Rifle-men are taught to distribute their fire beyond the known flanks of the enemy; therefore, the



Figure 138. Lining in a scoring area (pointing target) with the scoring template.

template is extended one inch beyond each flank of the target. The entire target area is divided into 10 equal spaces regardless of the length of the target. These spaces are known as distribution spaces (fig. 139).

- (1) Squad members distribute their fire on the targets as prescribed in paragraph 152*b* (1).
- (2) Each problem is fired on the basis of 50 rounds per squad. The squad receives 10 points for each distribution space in which it makes a minimum of three hits. In addition, it receives 2 points for each hit in the 2-point zone, and 1 point for each hit in the 1-point zone.
 - (a) No more than five hits in any distribution space are counted for score.
 - (b) The distribution score plus the score for hits, divided by two is the score for the problem. A total of 100 is a perfect score.

168. Zeroing of Weapons

a. Weapons used in landscape target firing are zeroed for 1,000 inches. A blank target with a row of eleven 1-inch black pasters is used for this purpose. The black pasters are placed six inches from, and parallel to, the bottom of the zeroing panel (fig. 137). Beneath the zeroing panel are numbers which correspond to the firers' positions on the firing line.

b. The zeroing procedure follows:

- (1) The sights are blackened.

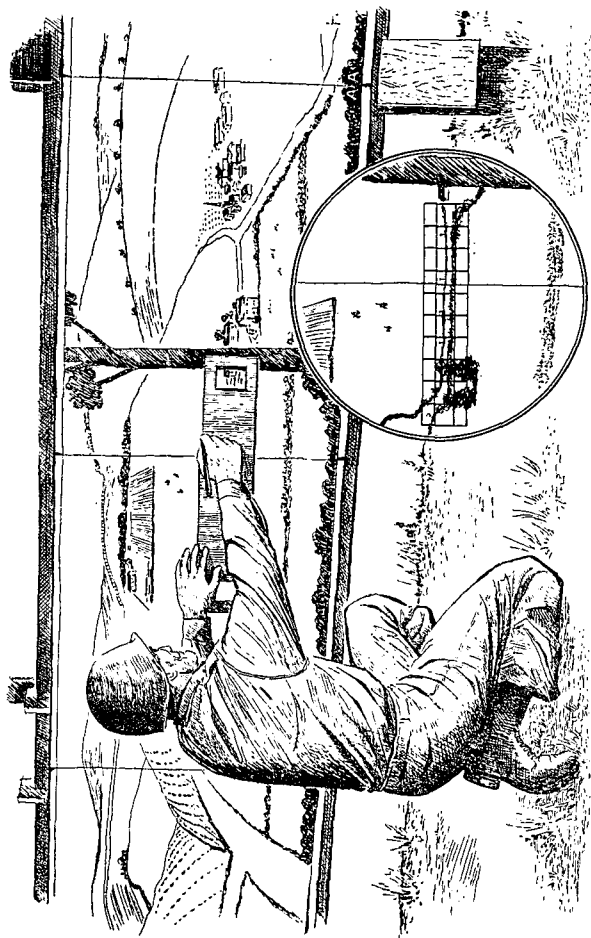


Figure 139. Lining in a scoring area (horizontal linear target) with scoring areas and distribution spaces.

- (2) The squad is deployed on the firing line in the same order that the numbers appear on the zero panel.
- (3) The instructor requires each rifleman to set his sights at his 200-yard zero or 12 clicks elevation and zero windage (zero elevation and zero windage for the .22 caliber rifles). The sight setting for the automatic rifle is 400 yards elevation and zero windage.
- (4) For an aiming point, each man is assigned a paster.
- (5) Three rounds are issued to each man on the firing line. The first round is loaded singly and fired at the instructor's command. The remaining two rounds are loaded and fired without command.
- (6) The squad leader inspects the target and, judging from the location of the center of impact of the shot group, gives each man the necessary sight correction for his weapon. He gives the correction in terms of clicks. At 1,000 inches, 1 click of windage or elevation on the M1 sight moves the strike of the bullet one-quarter inch; 1 click of windage or elevation on the automatic rifle sight moves the strike of the bullet 1 inch; and 4 clicks of windage or elevation on the .22 caliber rifle sight move the strike of the bullet one-half inch.
- (7) Steps (5) and (6) above are repeated as needed to zero each rifle.

169. Procedure for Conducting Firing Exercises

Landscape target firing exercises are conducted according to the following procedure.

a. Ammunition is distributed as follows:

(1) 50 rounds per squad per problem.

(2) No. 1 receives no ammunition.

(3) Nos. 2, 3, 4, 6, 7, 8, 10, and 11 receive 4 rounds each.

(4) Nos. 5 and 9 receive 9 rounds each.

b. The instructor has all members of the squads face to the rear of the firing line while he points out the target to the squad leaders. This may be done by either taking the squad leaders to the landscape panels and identifying the target or by having someone at the panels point to the target and describe it orally, such as, "line of riflemen" or "machinegun."

c. The instructor then directs the squad members to take a prone position with their weapon and be prepared to receive an oral fire command.

d. The instructor directs the squad leader to take charge of his squad and to issue his oral fire command to engage the target.

e. As soon as firing is completed and all weapons are cleared, the squad leader takes his men to the landscape panel where he scores and critiques them. He announces the score to the instructor, and it is recorded and compared with the scores of other squads.

f. The foregoing procedure is used for all exercises.

g. Firing exercises should progress from the simpler ones to the more complicated (point, linear, split point, and point-and-linear targets).

CHAPTER 9

TECHNIQUE OF FIRE OF THE RIFLE SQUAD (NIGHT)

Section I. INTRODUCTION

170. General

The techniques of applying and controlling squad fire during the day cannot be used when firing at night without artificial illumination. This chapter prescribes techniques to be used at night by a rifle squad to insure the effective application and control of fire in defense and the assault.

171. Degree of Illumination

For best results, it is advisable to conduct night firing training when there is less than a quarter-moon for illumination.

Section II. SQUAD DEFENSIVE NIGHT FIRING

172. General

Squad defensive night firing instruction should follow closely the instruction in the daylight technique of rifle fire and individual night firing (ch. 6). It consists of the following three phases plus a proficiency course.

Phase one—Orientation firing; first night.

Phase two—Day instruction firing; second day.

Phase three—Night application firing; second night.

173. Range Construction

The squad defensive night firing range can be constructed on any fairly level piece of terrain that is approximately 100 yards square and allows 180° firing and safety limits for small-arms firing. It consists of a firing line, 4 demolition pits, 20 black E type pop-up targets 20 yards from the firing line, 5 black E type flashing targets 75 yards from the firing line, and 2 loudspeaker pits to broadcast simulated battle noises over a public address system (figs. 140 and 144). Pop-up targets (fig. 141) may be added at various ranges up to 75 yards, if the training is conducted when there is more than quarter-moon illumination.

174. Orientation Firing

a. Purpose. This phase of training is designed to—

- (1) Demonstrate that the squad leader cannot adequately observe the terrain, the actions of his squad, or the enemy at night, and therefore cannot control his squad nor direct its fire in the same way to the same degree that he can in the daytime.
- (2) Convince the members of the squad that they should not fire indiscriminately at noises at night.
- (3) Show the riflemen why they should not fire at the sound or flash of automatic weapons, but should let automatic rifles engage such targets.

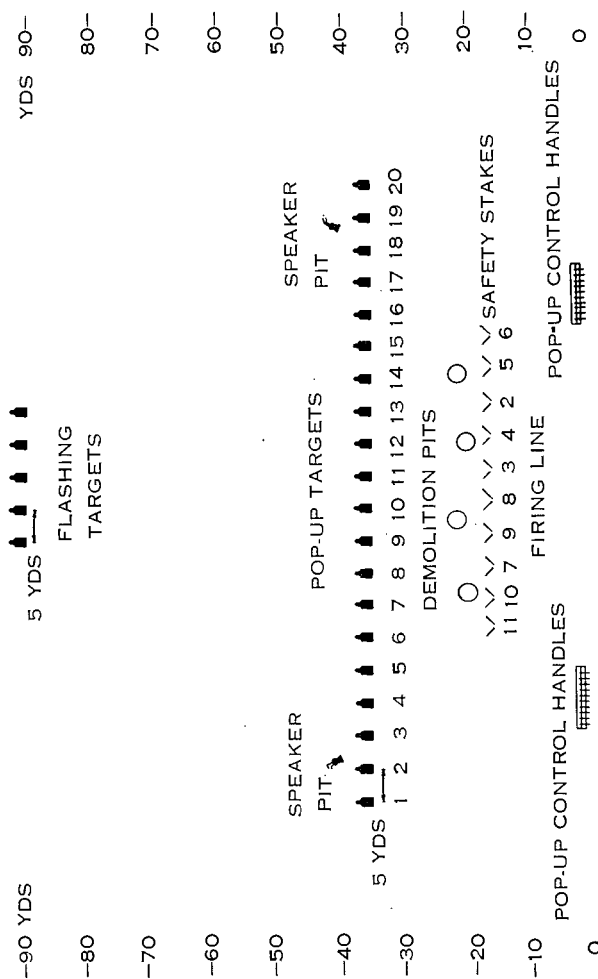


Figure 140. Range diagram.

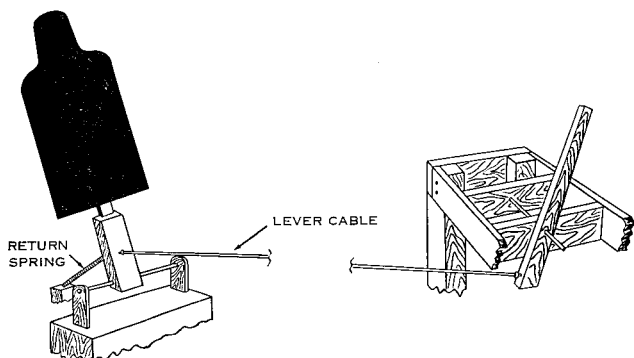


Figure 141. Pop-up target mechanism.

- (4) Convince the riflemen that their fire is not effective until they can see an enemy, and that they should then fire at him, even if he is not firing.
- (5) Demonstrate that many procedures for insuring fire distribution and concentration in daylight or artificial illumination are impractical in darkness.
- (6) Assure the rifle squad that these problems can be solved by applying special techniques at night.

b. Dark Adaptation. The men should spend at least one-half hour in darkness to adapt their eyes before firing. To protect their dark adaptation, red lights must be used for all scoring and other range functions where light is needed.

c. Conduct of Firing. The instructor tells the men that he is going to place them in a simulated combat defensive situation and that they are to engage the enemy exactly as they would in combat. He cautions them to remember all the difficulties they encounter so they can be discussed during

the critique. He gives the squad leader an opportunity to brief and instruct his squad, then places the squad on the firing line, prescribes safety precautions, issues 2 clips of ball ammunition per rifleman and 2 magazines of ball ammunition per automatic rifleman, and instructs the men to lock and load.

(1) The orientation problem develops in the following sequence:

- (a) After a period of silence, four separate demolition charges are detonated in front of the squad to simulate an enemy mortar or artillery concentration.
- (b) After another period of silence, a recording of the sound of bugles, drums, or some other noise-making device characteristic of Aggressor is played for 30 seconds from the loudspeaker pit in front of the squad. (These sounds may be produced in any other way that seems more practical.)
- (c) This is followed by a period of silence, then the recorded sound of machine-gun fire is played for 15 seconds without flashing targets, followed by an additional 45 seconds with the flashing targets flickering to coincide with the sound. (Instead of a recording, a machinegun firing live or blank ammunition in a pit may be used.)
- (d) This is followed immediately by the presentation of various combinations of the pop-up targets (fig. 140); for example—

<i>Time in seconds</i>	<i>Target</i>	<i>Direction</i>
00	1-2-3	Up
10	10-16	Up
15	18-19-20	Up
16	1-2-3	Down
25	10-16	Down
30	18-19-20	Down

(e) The instructor gives the command to cease fire. Weapons are cleared, ammunition is collected and counted, targets are scored, and the squad is assembled for a critique.

(2) The squad's score in the number of hits, number of rounds expended, and percentage of hits are retained for comparison with its application firing score (par. 176c).

d. Critique. The instructor critiques the orientation firing immediately, bringing out the following points and urging the squad members to join the discussion.

(1) At night, the squad leader cannot see (except in his immediate vicinity) either his men, the terrain, or the enemy. In addition, the enemy is so close to the defense position before the defenders can see him that they have no time to warn the squad leader and wait for his decision as to when and where to fire. Voice signals are not dependable and arm-and-hand signals cannot be seen at night. Since so few of the methods the squad leader uses in daylight to apply and control fire are of any use in the dark, the squad members must have a

practical and effective way of applying and controlling their fire individually. They can do this by learning special techniques and standing operating procedures and combining this knowledge with personal initiative.

- (2) There is a marked tendency toward trigger happiness among untrained squads at night. That is, the men fire indiscriminately and many times in succession at noises or suspected areas. This type fire has the following disadvantages:

- (a) It is inaccurate and ineffective.
- (b) It pinpoints defensive positions for the enemy before he gets within effective range.
- (c) It results in a premature and unnecessary expenditure of ammunition.
- (d) It tends to create confusion and tension within the squad and to break down any feeling of teamwork and control. Members of the squad should avoid firing at noises at night, but hold their fire until they can see an enemy and place accurate and effective fire upon him.

- (3) Riflemen should not fire at machinegun flashes alone. They stand little chance of hitting the gunner this way. They must hold their fire unless they can see well enough to align on the gunner.
- (4) By applying the techniques learned in individual night firing (ch. 6), the rifle-

men can effectively engage the enemy soldiers they see. This means they must hold their fire for close-in enemy. The automatic rifles should supplement the fire of the riflemen on close-in enemy when there are no enemy automatic weapons for them to fire at.

- (5) The daytime procedure of letting each rifleman select his portion of the target to insure proper fire distribution is impossible at night. No man in the squad can see the entire target and the fire tends to be random and haphazard. This must be overcome by assigning each rifleman a particular sector of responsibility for surveillance and by giving him explicit standing instructions on when and how to fire into his own sector and the sector of some other squad member.

175. Day Instruction Firing

a. Purpose. Day instruction firing is designed to teach the techniques that will enable the squad to fire effectively at night. It is conducted during the day so that mistakes can be observed and corrected.

b. Techniques of Applying and Controlling Fire. The points discussed during the critique of orientation firing are brought out again and are accompanied by instruction in the following techniques.

(1) Sector system of surveillance.

- (a) The squad leader must assign each rifleman a 30° sector of responsibility

for search. This gives the squad complete search and fire distribution over an arc of 180° . The team leaders supplement the riflemen by searching their teams' sectors, or the squad leader may assign each team leader a specific sector of search. The angle between successive hours on the clock is 30° , which makes the clock system a convenient way of teaching squad members where their sectors of search lie (fig. 142). Twelve o'clock is to the direct front of the squad, 9 o'clock is the left flank, and 3 o'clock is the right flank. A visible terrain feature may be pointed out as being 12 o'clock. The sector from 9 to 10 o'clock is assigned to No. 11 rifleman, from 10 to 11 o'clock to No. 10 rifleman, from 11 to 12 to No. 8 rifleman, etc. These sectors may be staked off in some way, but it must be pointed out that any markers that are more than a few yards away may be invisible at night. The assignment of a 30° sector of responsibility for search is recommended as a training medium. In a combat situation, the terrain, mission, size of the squad, and other factors may require modification of the size of the sectors. Individuals may be required to search a sector larger than 30° in order to insure complete coverage of the squad sector, including the

flanks. Each automatic rifleman will search the entire squad sector, or he may be directed to search his principal direction of fire.

- (b) In combat, the squad leader cannot just let the riflemen hit the dirt, cover a certain sector, and let it go at that. He checks each man as soon as possible, tells him how the squad is deployed on that particular piece of ground and indicates the location of the other men on his right and left. He changes sectors when necessary to tie them together and get an overlap between them so there will be no gaps.

(2) *Target allocation.*

- (a) The primary target for a rifleman is an observed foot soldier. Enemy automatic weapons are dangerous to the riflemen, but the riflemen must leave these targets to the automatic riflemen unless they can see the gun-

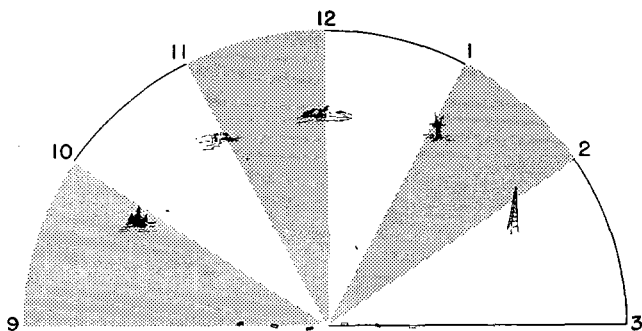


Figure 142. Sector system of surveillance.

ner or other crew members. The squad leader may designate certain riflemen to fire on an automatic weapon when the squad's automatic rifles are not functioning.

- (b) Enemy automatic weapons are left to the automatic riflemen because, by attaching a piece of luminous tape on the front sight base as shown in figure 143, he can use daytime sighting procedure. White adhesive tape may be used for this purpose, but it is not as effective as luminous tape. Because of the steadiness of the bipod, the automatic rifle can be held fairly steady while alining on the flash of automatic weapons. The automatic rifleman can sense the flash from the first burst, make an initial alinement, look through his peep sight, make finer adjustments on subsequent flashes, and place accurate fire on the weapon even though he cannot detect the gunner. The automatic riflemen should engage any enemy personnel they can see when no enemy automatic weapons are firing.

(3) *Application and control of fire.*

- (a) *Opening fire.* Each rifleman opens fire without command when he sees an enemy in his sector. Riflemen do not fire at random noises (except in certain circumstances when the squad leader will direct it) nor at the flash

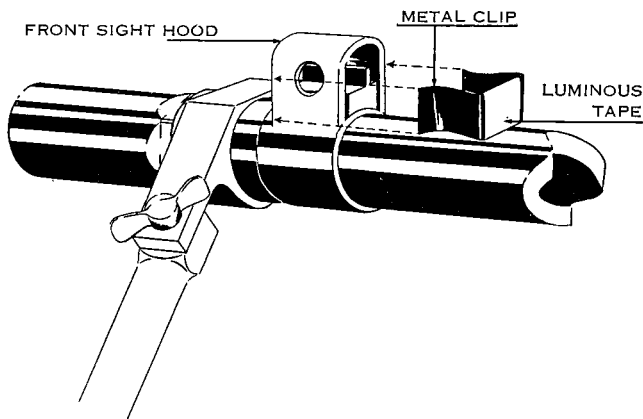


Figure 143. Luminous sight.

of automatic weapons. Automatic riflemen open fire on enemy automatic weapons within range as soon as they see their flash anywhere in the entire squad sector.

- (b) *Distribution of fire.* The technique for opening fire assures the correct distribution of fire. With each man opening fire as soon as an enemy appears in his sector, and continuing his fire as long as he has a target, good distribution is automatically obtained. For example, if the enemy is distributed evenly across the squad front, the fires of the squad are also distributed.
- (c) *Concentration of fire.* If the enemy is concentrated in one or two sectors, it is the riflemen observing those sec-

tors who know it first. When they fire, they alert all other men in the squad. If other squad members are not engaging enemy in their own sectors, they turn their attention to the sectors of squad members who are firing. If they can see the enemy concentration there, they fire at it. In this manner fire can be concentrated without the necessity of a fire command.

- (d) *Shifting fire.* An enemy concentration in one sector may be eliminated and a concentration may appear in other sectors. To release concentrations of fire built up by the technique described in (c) above, and to insure constant shifting of fire when necessary, the riflemen follow an additional technique. Whenever a rifleman fires into another man's sector, he fires only a few rounds, and then searches his own sector. If he sees no enemy in his sector, he may again shift and fire in any other sector where he can see an enemy target. In this manner fire is shifted to take care of concentrated or distributed targets without the necessity of a fire command.
- (e) *Ceasing fire.* When a rifleman no longer sees an enemy in his own or any other sector, he ceases fire without command.

(f) *Control by squad leader.* The squad leader must not feel that these techniques will enable his squad to function without any effort on his part. He must continually supervise the use of the firing techniques. He must move to the most dangerous sector to personally supervise the action, exerting his leadership in every possible way. When necessary, he supplements the techniques of applying and controlling fire with appropriate orders.

c. *Conduct of Firing.* On completing instructions in night firing techniques, the instructor places the squad in position and explains the safety precautions. The squad leader assigns each man his sector of responsibility. Each rifleman is issued one clip of ball ammunition and each automatic rifleman one magazine of ball ammunition. The instructor reminds the riflemen that this is simulated night firing, that they could not see the soldiers firing the automatic weapons at night, and that they are to hold their fire for close-in infiltrators.

(1) He orders the squad to lock and load, returns it to the control of the squad leader, and conducts the problem in the following sequence:

(a) Start the sound of machinegun fire. Flashes are invisible in daylight, so automatic riflemen must be told when to fire in this exercise. They are cautioned not to fire at sound alone at night.

- (b) Expose various combinations of pop-up targets to represent infiltrators; for example:

<i>Time</i>	<i>Targets</i>	<i>Direction</i>
00	6-7-8	Up
10	17-19	Up
15	11-12-15	Up
16	6-7-8	Down
25	17-19	Down
30	11-12-15	Down

- (2) A minimum of 2 dry runs and 3 wet runs of this problem should be conducted with a different combination of pop-up targets on each run. Each run is followed with a critique to point out mistakes and show correct techniques. The instructor discusses mistakes and the squad leader critiques individuals.

176. Night Application Firing

a. Purpose. Night application firing is designed to give the men practice in applying the principles and techniques learned and to build confidence in their ability to properly apply, control, concentrate, and distribute their combined fire at night.

b. Conduct of Firing. The instructor reviews briefly the principles and techniques of squad night firing. He discusses again the techniques used by automatic riflemen and has them practice dry runs on the flashing targets. He instructs them to pick up the flash, point their weapons in its general direction, look through the peep sight and pick up subsequent flashes, then glance at the front sight and aline the flash on top of

the tape. The flash will look about one-third as large as normal when looking through the peep sight. Next, he has the automatic riflemen engage the flashing targets with one magazine of ball ammunition each for practice, and has the targets scored. Following this, the squad repeats the firing portion of orientation firing (par. 174c), using different combinations of targets, but the same time intervals.

c. Critique.

- (1) The scores made in application firing are compared with those made in orientation firing to demonstrate improvement and instill confidence. The percentage of improvement of application firing over orientation is determined by subtracting the orientation firing score from the application firing score and dividing the result by the orientation firing score.
- (2) To help establish confidence, it is important to impress the men with their improvement in fire discipline. For example, they should be told that they did not waste ammunition on noises and prematurely disclose their positions; that by allowing only the automatic rifles to engage long-range automatic weapons, the riflemen had ample ammunition to deal with close-in enemy; that constant search and fire technique on a sector basis had the effect of preventing an enemy from closing with the squad without being engaged; that fire distribu-

tion was effective; that by assisting with fire in adjoining sectors, good concentration of fire was obtained; and that in combat their fire discipline would have insured a supply of ammunition to deal with subsequent attacks.

177. Squad Defensive Night Firing Proficiency Course

a. General. After completing the three training phases of squad defensive night firing, the squad is required to fire a proficiency course. This course gives the men additional and more realistic practical exercise, and serves as a testing device so that unit commanders can determine the level of proficiency attained by the individual squads. It is recommended that this course be conducted on the night following night application firing.

b. Proficiency Range. The range consists of a firing line containing foxholes for the squad members; 10 demolition pits forward of the squad position and 2 to the rear; 3 banks of 5 black E type pop-up silhouette targets each, at ranges of 20, 35, and 50 yards to the right front, and 3 banks at ranges of 15, 25, and 35 yards to the left front of the squad position; 5 black E type flashing targets at a range of 75 yards to the front of the squad position; 2 black E type flashing targets at a range of 200 yards, 1 to the right front and 1 to the left front of the squad position; and 2 loud-speaker pits to the squad front and 1 to the squad rear (fig. 144).

c. Conduct of Firing. The instructor tells the squad that it is in a defensive position, that it has already repelled a night attack, but that it can expect more attacks before daylight. The squad

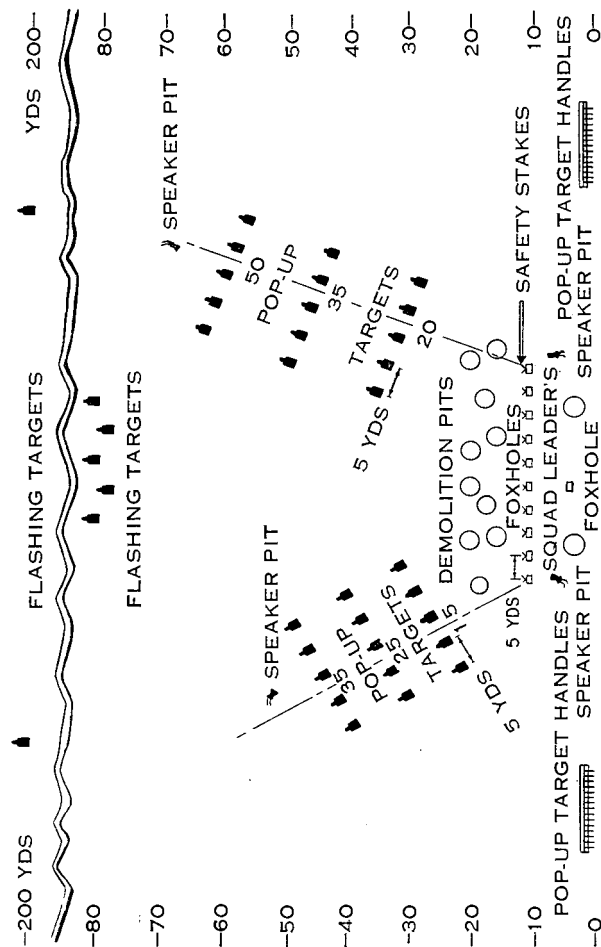


Figure 144. Proficiency course.

leader is given an opportunity to orient his men and give them instructions. The squad is placed in position, instructed in safety precautions, issued 4 clips of ball ammunition per rifleman, 3 magazines of ball ammunition per automatic rifle, and the men are instructed to lock and load. When the squad leader signals READY, the problem is developed in the following sequence:

- (1) After a brief silence, flute and drum music is played over loudspeakers for 30 seconds.
- (2) Demolitions are exploded sporadically for one minute to simulate enemy mortar and artillery fire.
- (3) After a brief silence, the two flashing targets at the 200-yard range are activated for one minute, accompanied by a synchronized recording of machinegun fire.
- (4) The five flashing targets at the 75-yard range are activated for 1½ minutes, accompanied by a synchronized recording of machinegun fire.
- (5) A recording of a voice shouting commands in a foreign language and insults in broken English is played over a loudspeaker for 15 seconds.
- (6) The three banks of pop-up targets to the squad's right front are presented in this order: the farther bank is exposed for 15 seconds, then lowered; after a 10-second pause, the center bank is exposed for 15 seconds and then lowered; after a 10-second pause, the near bank is ex-

posed for 15 seconds and then lowered. This simulates rushing infiltrators, closing with the position.

- (7) After a brief pause, the three banks of pop-up targets to the left front of the squad are exposed in the same manner.
- (8) On the instructor's signal, the squad leader gives the command to cease fire. Weapons are cleared, ammunition is collected, targets are scored, and the problem is critiqued.

d. Evaluation and Scoring. Until experience factors become available, the minimum score for this course is left to the discretion of major unit commanders. Untrained squads tested on the course averaged 4 percent hits with the rounds expended. Trained squads averaged 13 percent hits with rounds expended, which is an improvement of 225 percent. In scoring this problem, fire discipline, fire distribution, fire concentration, and fire control should be considered, as well as percentage of hits. Ricochet hits are scored as hits.

Section III. SQUAD ASSAULT NIGHT FIRING

178. General

Squad assault night firing instruction should closely follow squad defensive night firing instruction. It consists of the following three phases, all of which may be conducted (along with the proficiency course) in one night:

- a.* Phase one—Orientation firing.
- b.* Phase two—Instruction firing.
- c.* Phase three—Application firing.

179. Range Construction

The range has 10 flashing targets. A wood or metal canister is sunk into the ground for each target. The black E type target, mounted on a target stake, can then be easily placed into position and removed. Immediately in front of each target is a stake 20 inches high with a red flickering light attached. When the E type target is in position, the light is in its center (fig. 145). Other field-expedient type lights may be used. There is a marked starting line 70 yards from the target line, a firing line 60 yards from the target line, and a cease-fire line 10 yards from the target line (fig. 146). This range can be used to conduct orientation, instruction, application, and proficiency firing.

180. Orientation Firing

a. Purpose. This phase of training is designed to let the squad members experience the difficulties encountered when using daytime firing techniques while assaulting at night.

b. Dark Adaptation. Squad members should be allowed a minimum of one-half hour to adapt their eyes to the darkness before firing. To protect their dark adaptation, red lights must be used for scoring and other range functions requiring illumination.

c. Conduct of Firing. The instructor does not suggest any way for the squad to assault the position. He briefs the men on the safety rules (par. 6, app. III) of the range and gives them a tactical situation that will start the problem with the squad deployed as skirmishers on the starting

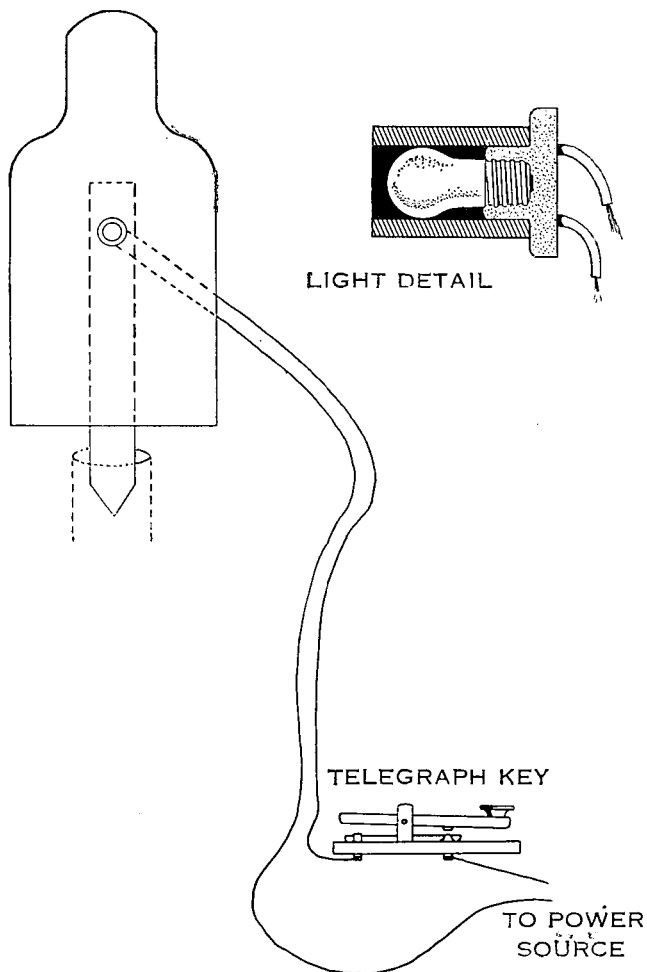


Figure 145. Flashing target mechanism.

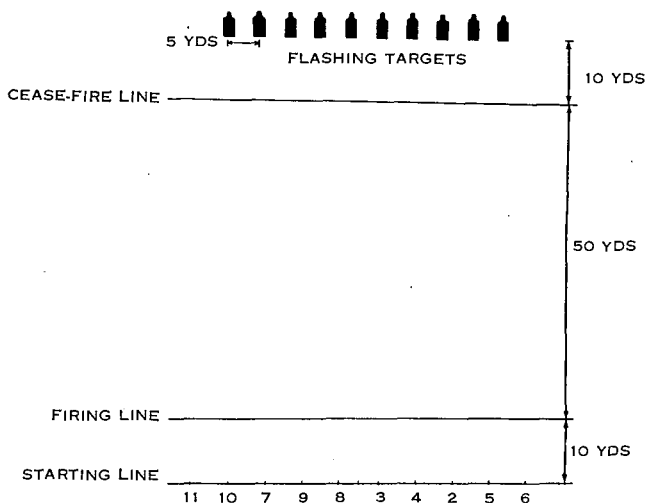


Figure 146. Range for squad assault night firing instruction.

line. He should allow the squad leader to brief his squad on anything he deems necessary to conduct the exercise. When the squad is deployed on the starting line, the instructor issues 4 clips of tracer ammunition per rifleman and 3 magazines per automatic rifleman and orders the squad to lock and load. He then returns the squad to the squad leader's control and the orientation problem develops in the following sequence:

- (1) Upon the order of the squad leader, the squad advances toward the enemy positions.
- (2) As the squad crosses the firing line, the flashing targets are activated. The squad begins its assault fire while continuing its advance.

- (3) When the squad reaches the cease-fire line, the members are halted by their coaches; weapons are unloaded and cleared; ammunition is collected and counted; targets are scored; and the squad is assembled for a critique. Scores in number of hits, rounds expended, and distribution of hits are retained for comparison with application firing scores.

d. Critique. The instructor conducts a critique as soon as orientation firing has been completed. It should cover the following points:

- (1) Greater proficiency must be attained in the use of the underarm position while assaulting at night.
- (2) It is difficult to judge the exact speed needed to keep the squad on line at night.
- (3) Stopping or slowing down to reload affects the rate of movement, rate of fire, and squad alinement.
- (4) There is a tendency to fire high from the underarm position.
- (5) Greater proficiency in nighttime fire distribution procedures must be attained in night assault firing.

181. Instruction Firing

a. Purpose. This phase of training is designed to teach special night techniques and improve the performance of certain daytime techniques to compensate for the difficulties encountered in orientation firing.

b. Requirements. The squad must understand and be drilled in the five following requirements

of the night assault. The ultimate objective is to bring the men to the point where they can carry out all of these requirements in the assault without stopping, breaking alinement, or taking their eyes off the target.

(1) *Firing position.*

(a) The rifleman always uses the under-arm position in a night assault. As he moves forward, he keeps the rifle pointed at the target area and fires a round each time his left foot strikes the ground. (Left-handed firers fire each time the right foot strikes the ground.) This technique eliminates bounce at the moment of firing and establishes a steady rate of fire.

(b) The automatic riflemen use the crouch position, the same position they use in a daylight assault. This position is described in FM 23-15.

(2) *Speed of movement and maintaining alinement.*

(a) The squad moves as fast as possible consistent with maintaining alinement and accuracy of fire. A base man within the base squad is designated for the squad members to dress on so they can regulate their speed of movement. They must not stop for any reason once the assault begins.

(b) The squad is fully deployed in the assault to bring its maximum firepower to bear on the objective area. To keep this alinement during a firing

assault, each man senses the position of the men to their right and left by the muzzle flashes of their weapons.

- (c) The interval between men is five yards under the darkest conditions. The interval can be increased as the amount of moonlight increases.
- (3) *Reloading.* The men must learn to reload at night while moving without disrupting speed and alinement or causing definite lulls in firing. To do this, they must check their ammunition, carefully place it in their belts, and practice loading their weapons without watching their movements. That is, they must learn to take a clip from the belt and load it by the sense of touch.
- (4) *Keeping the fire down.* The tendency to fire high from the underarm position at night can be corrected by using tracer ammunition in practical exercises so each man can see how high he is firing and adjust his aim.
- (5) *Fire distribution.* Each rifleman fires on the portion of the target that corresponds to his position in the assault line. Each automatic rifleman covers half of the squad target. Normally, the team leaders move in the assault line in the center of their teams and fire to increase the firepower of the squad in the final assault.

c. *Practical Exercises.*

- (1) *Dry exercise.* The men are deployed on the starting line (fig. 146) and told

that they will practice dry runs to get more experience using the underarm position and to learn the speed of movement necessary to maintain squad alinement. Dress is on the base man and there is a 5-yard interval between men. The squad leader gives the command to move out and the squad advances, simulating fire from the underarm position as it moves to the cease-fire line. The squad is halted, about faced, and the process is repeated uprange to the starting line. The squad should maintain alinement and cover the distance from the starting line to the cease-fire line in approximately one minute. A minimum of two dry runs is recommended.

(2) *Wet exercises.*

- (a) The instructor deploys the squad on the starting line and issues each rifleman 2 clips of ball ammunition and each automatic rifleman 2 magazines of ball ammunition. He tells them that they must now learn to fire and reload without disrupting speed or alinement. He reminds them to sense the muzzle flash of neighboring rifles to help them stay alined. He orders them to lock and load and move out on the squad leader's command. When the squad crosses the firing line, the flashing lights are activated. The squad begins its assault fire and advances until it reaches the cease-fire

line. The squad is halted on the cease-fire line, the men are ordered to lock and unload, weapons are cleared, unexpended ammunition is collected, and individuals are critiqued by their coaches.

- (b) The second wet exercise is like the first one except that each rifleman is issued 2 clips of tracer ammunition and each automatic rifleman is issued 2 magazines of tracer ammunition. In this exercise, the men concentrate on keeping their fire down and on distributing it properly while applying the techniques already learned. A minimum of 3 wet runs is recommended for this exercise.

182. Application Firing

Application firing is designed to give the squad practice in applying the principles and techniques learned and to let the men gain confidence in their ability to properly apply, control, and distribute their combined fire in a night assault. After a brief oral review of the principles and techniques, the squad repeats the firing portion of orientation firing (par. 180c). The scores made in application firing are compared with those made in orientation firing to demonstrate improvement and instill confidence.

183. Squad Assault Night Firing Proficiency Course

a. General. After completing the three training phases of assault fire, the squad is required to fire a proficiency course. A break of at least

one-half hour should be given between application and proficiency firing to allow the squad to absorb the techniques learned and to rest. This course gives the men additional practical exercise and serves as a testing device so that unit commanders can determine the level of proficiency attained.

b. Proficiency Course Range. The same range used for training in night assault can be used for the proficiency course (fig. 146).

c. Conduct of Firing and Scoring. The same firing procedure used for orientation and application firing is used for proficiency firing, except that a minimum score is required. In scoring this problem, the rate of advance, rate of fire, rounds expended, and fire distribution and control should be considered to determine the improvement over orientation firing. Until experience factors become available, the minimum score is left to the discretion of major unit commanders.

APPENDIX I

REFERENCES

- AR 370-5 Qualification in Arms.
- AR 320-50 Authorized Abbreviations.
- AR 385-63 Safety Regulations for Firing Ammunition for Training, Target Practice and Combat.
- SR 320-5-1 Dictionary of United States Army Terms.
- FM 5-20A Camouflage of Individuals and Infantry Weapons.
- FM 7-10 Rifle Company, Infantry Division Battle Group.
- FM 21-5 Military Training.
- FM 21-6 Techniques of Military Instruction.
- FM 21-26 Map Reading.
- FM 21-30 Military Symbols.
- FM 21-40 Defense Against CBR Attack.
- FM 21-75 Combat Training of the Individual Soldier and Patrolling.
- FM 23-7 Carbine, Caliber .30, M1, M1A1, M2, and M3.
- FM 23-15 Browning Automatic Rifle, Caliber .30, M1918A2.
- FM 23-55 Browning Machineguns, Caliber .30, M1917A1, M1919A4, M1919A4E1, M1919A6, and M37.
- TM 9-280 Caliber .22 Rifles, All Types.
- TM 9-855 Targets, Target Material, and Training Course Layouts.

TM 9-1275 Ordnance Maintenance, U. S. Rifles,
Caliber .30, M1, M1C (Sniper's), and M1D
(Sniper's).

TM 9-1990 Small Arms Ammunition.

TM 9-2205 Fundamentals of Small Arms.

ATP 21-114 Basic Combat Training Program.

ASubjSed 7-11 Advanced Rifle and Sniper Train-
ing.

ASubjSed 21-31 U. S. Rifle, Caliber .30, M1.

DA Pam 23-2 Hits Count.

DA Pam 108-1 Index of Army Motion Pictures,
Filmstrips, Slides, and Phono-Recordings.

APPENDIX II

FIRING TABLES AND EXERCISES

Section I. RIFLE FIRING COURSES

1. Preparatory Marksmanship

Preparatory marksmanship firing exercises (total rounds 30).

Range	Time limit	Rounds	Position
1,000''-----	None-----	6	Prone.
1,000''-----	None-----	6	Sitting.
1,000''-----	None-----	6	Kneeling.
1,000''-----	None-----	6	Squatting.
1,000''-----	None-----	6	Standing.

NOTES

1. All firing consists of 3-round shot groups using the ball and dummy method.
2. No zero is necessary. The size of the shot group is the determining factor.

2. Combat Qualification Course

a. Scores. The rifleman's qualification classification is determined by the score he obtains by firing table III. He must confirm this qualification by scoring at least the minimum requirement with tables IV, V, and VI. A summary of these scores is listed below:

(1) Qualification classification (table III):	
Possible	250
Expert	212
Sharpshooter	187
Marksman	160
(2) Minimum requirements to confirm qualification:	
Table IV	100
Table V	65
Table VI	25

b. Ammunition. The following is a summary of the ammunition required for the course:

<i>Table</i>	<i>Rounds required</i>
I	59
II	102
III (fired twice)	100
IV (fired twice)	80
V (fired twice)	56
VI (fired three times)	48
VII	15
Total	460

c. Firing Tables:

Table I. Combat qualification course, instruction firing, 1,000-inch (total rounds—59)

Range	Time limit	Rounds	Position
1,000''	None	*9	Prone (for zero).
1,000''	None	8	Sitting.
1,000''	None	8	Kneeling.
1,000''	None	8	Squatting.
1,000''	None	8	Standing.
1,000''	50 seconds ..	9	Sitting (rapid).
1,000''	50 seconds ..	9	Prone (rapid).

*The rifle is zeroed by the single-shot method (par. 75). A sandbag may be used when zeroing.

Table II. Combat qualification course, instruction firing, known distance (total rounds—102).

Range (yards)	Time limit	Rounds	Position
100-----	None-----	*9	Prone (for zero).
100-----	8 minutes--	8	Standing.
200-----	None-----	*9	Prone (for zero).
200-----	8 minutes--	8	Kneeling.
200-----	8 minutes--	8	Squatting.
200-----	8 minutes--	8	Sitting.
200-----	50 seconds--	9	Sitting (rapid).
300-----	None-----	*9	Prone (for zero).
300-----	8 minutes--	8	Prone.
300-----	50 seconds--	9	Prone (rapid).
500-----	None-----	*9	Prone (for zero).
500-----	8 minutes--	8	Prone.

*The rifle is zeroed by the single-shot method (par. 75). A sandbag may be used.

NOTES

1. The time limit for slow fire should be adjusted to the benefit of the firer in cases of slow pit operation, faulty target equipment, or the need for additional instruction.

2. When a 500-yard range is not available, the 8 rounds prone at 500 yards will be replaced by 8 rounds sitting at 300 yards.

Table III. Combat qualification course, record firing, known distance (total rounds—100). (This table is fired twice—once for practice and once for record.)

Range (yards)	Time limit	Rounds	Position
100-----	8 minutes--	8	Standing.
200-----	8 minutes--	8	Kneeling or Squatting.
200-----	50 seconds--	9	Sitting (rapid).
300-----	8 minutes--	8	Prone.
300-----	50 seconds--	9	Prone (rapid).
500-----	8 minutes--	8	Prone.

Possible score—250.

Minimum requirement for qualification—160.

NOTES

1. The time limit for slow fire should be adjusted to the benefit of the firer in case of slow pit operation or faulty target equipment.

2. When a 500-yard range is not available, the 8 rounds prone at 500 yards will be replaced by 8 rounds sitting at 300 yards.

Table IV. Combat qualification course, instruction and record firing, combat position firing. (This table is fired twice—once for practice and once for record. Total rounds required—80.)

Lane	Range (yards)	Time (sec/tgt)	Rounds	Target	Position
1	150-300	30	4	1 "F" & 1 "E."	Foxhole.
2	200-400	30	4	1 "F" & 1 "E."	Rubble pile.
3	300-400	30	4	2 "E"-----	Stump.
4	200-325	30	4	1 "F" & 1 "E."	Window.
5	150-250	30	4	2 Moving "E."	Bunker.
6	500	60	4	1 Veh Sil- houette.	Prone.
7	125-400	30	4	1 "F" & 1 "E."	Barricade.
8	250-350	30	4	2 "E"-----	Forward slope.
9	175-325	30	4	1 "F" & 1 "E."	Rooftop.
10	125-275	30	4	1 "F" & 1 "E."	Log.

Scoring notes:

1. Ricochet hits are scored.

2. All lanes except lane 6:

For each hit..... 5 points

For each unexpended round if both targets are hit..... 5 points

Possible points for each lane..... 20 points

3. Lane 6:

For each hit..... 5 points

Possible points for this lane..... 20 points

4. Possible score..... 200

5. Minimum requirement to confirm qualification..... 100 points

Table V. Combat qualification course, instruction and record firing, quick firing (total rounds—56). (This table is fired twice—once for practice and once for record.)

Phase Line	Range (yards)	Time (seconds)	Rounds	Target	Position
Preliminary	35	No limit	8	1 "F" on dirt bank.	Under-arm.
First	15-35	3	8	1 "F"	Under-arm.
		4	-----	2 "F"	
		4	-----	1 "F"	
Second	15-35	4	8	1 "E"	Under-arm.
		4	-----	1 "F"	
		4	-----	2 "E"	
		4	-----	2 "F"	
		5	-----	1 "E"	
Third	15-45	4	8	moving.	Under-arm.
		3	-----	2 "F"	
		3	-----	1 "E"	
		3	-----	1 "F"	
		3	-----	1 "E"	
		5	-----	1 "E"	
				moving.	

NOTES

1. The preliminary firing is conducted prior to the instruction firing of this table only. The range is set up with a dirt bank at one end approximately 15 feet high. "F" type targets are placed at ground level immediately in front of the bank and a firing line is placed 35 yards in front of the targets. The riflemen fire 8 rounds at the targets to adjust their fire.

2. Each firer is issued 24 rounds for the 18 silhouette targets. He uses the extra rounds when necessary. Three reaction type targets (fig. 105) are included in the course in addition to the 18 targets listed above.

Scoring notes:

1. For each target hit (ricochets are scored as hits)..... 5 points
2. For each unexpended round if all targets are hit..... 5 points
3. Deduct five points for each reaction target hit. These targets (painted) represent friendly soldiers.
4. Possible score..... 120
5. Minimum requirement to confirm qualification..... 65

Table VI. Combat qualification course, orientation, instruction, and record firing, night firing. (This table is fired three times—once each for orientation, practice, and record. Total rounds required—48.)

Range (yards)	Time	Rounds	Position	Target
25-----	* * * *	8	Prone-----	1 "M".
50-----	* * * *	8	Prone-----	1 "M".
<i>or</i> (depends upon levels of illumination)				
50-----	* * * *	-----	Prone-----	1 "M".
75-----	* * * *	-----	Prone-----	1 "M".

NOTES

- The following ranges are used according to the level of illumination:
 - One-quarter moon or less----- 25 and 50 yards
 - Greater than one-quarter moon----- 50 and 75 yards
 - The rifleman fires 8 rounds at the near range and 8 at the far range. Targets are checked after firing at each range.
 - This table is fired the first night for orientation and should precede all other instruction in night firing. The next firing should be on table VII for daytime instruction. Table VI is then fired again at night: once for instruction and once for record.
- Scoring Notes:

- For each hit----- 5 points
- Possible score----- 80 points
- Minimum requirement to confirm qualification----- 25 points

Table VII. Combat qualification course, day instruction firing, night firing. (Total rounds—15.)

Range (yards)	Time	Rounds	Position	Target
50	* * * *	15	Prone-----	1 "B".

NOTES

- This table is not scored.
- Each rifleman fires five 3-round shot groups at the target. Each group is checked and spotted after firing.

3. Proficiency Course

a. Scores. The rifleman's proficiency classification is determined by the score he makes in firing the proficiency table:

Possible	250
Superior	202
Excellent	175
Satisfactory	150

b. Ammunition. The following is a summary of the ammunition required:

Practice firing	59
Proficiency firing	50
Total	109

c. Firing Table. Instruction, proficiency firing, 1,000-inch or 200 yards. (This table is fired twice—once for practice and once for proficiency. Total rounds required—109.)

Time limit	Rounds	Position
None	*9	Prone (for zero).
8 minutes	8	Prone.
8 minutes	8	Sitting.
8 minutes	8	Kneeling or squatting.
8 minutes	8	Standing.
50 seconds	9	Sitting (rapid).
50 seconds	9	Prone (rapid).

*Fired for instruction only. Use of a sandbag is optional. The rifle is zeroed by the single-shot method (par. 75).

4. Familiarization Course

a. Scores. The following scores may be used as a guide to determine results of familiarization firing:

Possible	105
Excellent	85
Good	70
Fair	60

b. Firing Table. Familiarization course, 1,000-inch or 200-yard range (30 rounds).

Time limit	Rounds	Position
None-----	*9	Prone (for zero).
None-----	4	Sitting.
None-----	4	Kneeling or squatting.
None-----	4	Standing.
50 seconds-----	9	Sitting (rapid).

*The rifle is zeroed by the single-shot method (par. 75). A sandbag may be used.

Section II. SNIPER EXERCISES

5. General

a. The 31-hour course outlined in Army Subject Schedule 7-11 is considered the minimum needed to train a sniper. If more time is available, it should be used for the improvement of the sniper's weaker points. The exercise instructions in this section are intended for use with the subject schedule.

b. In addition to these practical exercises, the sniper is instructed in recognition of enemy characteristics, uniforms, and equipment, and in his organization and tactics.

6. Range Determination Exercises

a. Purpose. To give the sniper practice in estimating ranges up to 1,000 yards.

b. Method. The course is constructed and the instruction presented as outlined in paragraph 13 of this appendix.

7. Exercises in Selecting Sniping Positions and Routes of Approach

a. Purpose. To teach the sniper how to select concealed and inconspicuous firing positions and routes of approach to them.

b. Methods.

- (1) The instructor indicates a target in the sniping area and tells the sniper to select and occupy the best sniping position in the immediate vicinity and to simulate firing a shot at the target. The instructor then comments on the good and bad points of the sniper's actions and the position he selected.
- (2) The instructor selects a piece of terrain as the assigned sector of fire for an observer-sniper post and marks several possible locations for a sniping post with panels or flags. He tells the snipers to choose the best of these positions for a sniping post and the second best for an alternate location. He has each man name the characteristic that caused him to select or reject each of the possible locations. The instructor then gives his own selections with a discussion of the advantages and disadvantages of each post. He repeats the exercise on varied and unfamiliar terrain without using panels to guide the men in their selection.
- (3) The instructor shows the sniper a sector assumed to be occupied by the enemy. He tells the sniper to study the ground and select a route forward to a desig-

nated sniping position. When the sniper has made his selection (by pointing, describing, or traversing the route), he is required to explain the reasons for his solution. The instructor points out any errors, then takes the sniper to the designated firing position. He tells the sniper he has just fired a shot from that position and must select a new position and a route to it. When the sniper has presented his solution, he is required to analyze it as before.

c. Common Errors.

- (1) The selected position is too exposed or conspicuous.
- (2) The selected position does not have a good field of fire.
- (3) The sniper is revealed by the outline of his helmet, shoulder, forearm, or leg, depending on the angle from which he is viewed.
- (4) The selected position is in the sunlight instead of in the shade. It does not have a covered route of withdrawal.
- (5) The sniper's movements while approaching the sniping position are too abrupt and jerky.

8. Preliminary Firing Exercises

a. First Exercise.

- (1) *Purpose.* To familiarize the sniper with his weapon and to zero his weapon at 200, 300, and 400 yards.

- (2) *Method.* The sniper zeros at 200, 300, and 400 yards on a known-distance range.

b. Second Exercise.

- (1) *Purpose.* To zero the sniper's rifle at 500, 600, and 800 yards.
- (2) *Method.* A zero is obtained on a known-distance range for each of the above ranges.

c. Third Exercise.

- (1) *Purpose.* To teach the sniper how to use the holdoff method of aiming.
- (2) *Method.* Using his 300-yard zero, the sniper goes to the 200-yard line and aims at a spotter placed 6 inches below the center of the bull. When he becomes familiar with this measured holdunder, the spotter is removed and the sniper is told to judge the holdunder without it. He then goes to the 400-yard line and uses a spotter placed 14 inches above the center of the bull as an aiming point. When he becomes familiar with this measured holdover, the spotter is removed and he judges the hold-over without it. The training is continued with the 200- and 400-yard zero.

9. Holdoff Exercises

a. Purpose. To practice holdoff by firing at obvious and obscure targets at unknown ranges.

b. Method. The instructor places E and F silhouette targets in a suitable area with varied terrain at various ranges from 100 to 600 yards. The sniper fires at each target, using his 400-yard

zero and estimating the range and holdoff. The exercise is repeated on new terrain until the sniper is proficient in hitting field targets at varying ranges. As the training progresses, the targets should be more concealed.

10. Field Firing Practice Exercises

a. Purpose. To develop speed in locating targets, estimating range, judging holdoff, and firing accurately without giving away the sniper's position.

b. Methods. (The following exercises are fired three times; at dawn, midday, and dusk. When one sniper has fired the three exercises, he exchanges duties with his observer.)

- (1) *First exercise.* The observer-sniper team is allowed 16 rounds, without time limit, to hit 8 targets (4 F and 4 E silhouette targets). The targets are exposed one at a time, each from its own foxhole. The F targets are exposed at ranges up to 200 yards. The E targets are exposed at ranges varying from 200 to 600 yards. Upon signal from the instructor, the operator in a foxhole exposes a target. When the target is hit or two rounds have been fired at it, the operator pulls it down. The instructor then signals for the next target. He repeats this procedure until all eight targets have been fired upon. He varies the order of appearance of the targets so that the sniper never knows where the next target will appear. An umpire is stationed at the sniper's position to make

sure that the team observes the rules of cover and concealment. The umpire does not let the sniper fire if he is not correctly concealed. The team is scored as follows:

	Possible score
For each F target hit—3 points.....	12
For each E target hit—2 points.....	8
For each round saved—*4 points.....	32
Total	52

*This scoring system places a premium on first-round hits.

- (2) *Second exercise.* This exercise is the same as the first except that the observer-sniper team is allowed only one minute per target to search the area, find the target, and fire at it.
- (3) *Third exercise.* The observer-sniper team is allowed 12 rounds to hit 4 E silhouette targets placed at ranges varying from 600 to 800 yards. The sniper uses an exact sight setting for each target. The procedure is similar to the first exercise. The scoring is as follows:

	Possible score
For each E target hit—4 points.....	16
For each round saved—2 points.....	16
Total	32

(The total possible individual score for the three exercises is 136; the total possible team score is 272.)

11. Field Firing—Record Exercises

a. Purpose. To test the sniper's speed in locating targets, estimating range, judging holdoff, and firing accurately without giving away his position.

b. Method. The exercises in paragraph 10 are fired once for record on terrain that is not familiar to the sniper.

Section III. RANGE DETERMINATION EXERCISES

12. General

To train riflemen to estimate ranges successfully, the 100-yard mental unit of measure must be established in their minds. To do this, their attention is called first to measured units laid out in the training areas. During marches and field exercises they are given practice in estimating ranges to prominent terrain features such as buildings, trees, and road intersections. In a similar manner, they are taught to observe the appearance of objects at known distances. Range estimation cards may be used in the initial instruction to provide a record of progress. Squad leaders are required to check their men and give individual attention to those found to be below standard.

13. Exercises in Range Determination

The exercises suggested in this section are designed to give the soldier a thorough understanding of the principles used in estimating ranges by eye. The exercises alone are not enough to insure continued proficiency in this subject. Proficiency can be acquired, maintained, and improved only by regular periods of practical work. When possible, short periods of practical work should be included in all types of field training.

a. Exercise No. 1.

- (1) *Purpose.* To familiarize the soldier with the 100-yard mental unit of meas-

ure, and the method of applying it in estimating ranges on varied terrain.

- (2) *Method.* Panels are put up from 100 to 500 yards at 100-yard intervals so the soldiers can compare the appearance of the 100-yard units of measure over the varied terrain. They are then moved to the selected 400-yard marker and are formed facing the 500-yard marker in the same course. They are given an opportunity to fix the 100-yard mental unit of measure firmly in their minds, then they move back toward the starting point until they are on line with the 300-yard marker (200 yards from the 500-yard marker). Next, they move to a point on line with the 200-yard and then the 100-yard markers, thence to the starting point. At each stopping point, they study the appearance of the 100-yard unit of measure and apply it successively up to 500 yards. This exercise should be practiced at each of the ranges in the prone, kneeling, and standing positions. The unit receiving instruction may be divided into two or more smaller groups which are rotated over the several courses in the area.

b. *Exercise No. 2.*

- (1) *Purpose.* This exercise provides practice in determining range by using the 100-yard mental unit of measure.
- (2) *Method.* Ranges are measured from a suitable position to various objects with-

in 1,000 yards. The objects selected should be so located that the men cannot make comparative judgments of range, but will have to make independent estimates. The instructor points out the objects and the men enter their estimates on range estimation cards or worksheets. They should make at least half of their estimates from the prone or kneeling position. Not more than 30 seconds are allowed for each estimate. When the men have entered their estimated ranges to five or six objects, the instructor announces the true ranges and requires the men to analyze their error in each estimate and jot down the reason in the remarks column of the range estimation card. The men enter any comment, such as the nature of the terrain or the climatic condition which caused the error. Interest and competition can be developed by maintaining individual records and squad averages. Also, the men who are below standard are readily spotted and can be given additional instruction.

c. *Exercise No. 3.*

- (1) *Purpose.* This exercise provides practice in determining range by the appearance of objects.
- (2) *Method.* From a suitable position on hilly terrain, men are posted in concealed positions at 100-yard intervals for a distance of 500 yards. The class studies the difference in the appearance of

the men at different ranges. When the soldiers become proficient in this, they will be able to determine the range to targets by their appearance.

- (a) On signal, all the posted men stand up. The instructor points out that the men seem to decrease in size as the distance to them increases. He calls attention to the gradual disappearance of details (facial features, hands, arms, legs, helmet, belt, and rifle).
- (b) On signal, all the posted men kneel. The class then studies the kneeling figures. The instructor calls the class' attention to the details of the kneeling men, remarking that they seem to disappear at closer ranges than when they were standing.
- (c) On signal, all posted men take up the prone firing position and aim their rifles at the class. The class studies the appearance of the prone figures. The instructor points out that fewer details are visible now, even at the shorter ranges.

d. *Rules for Instructors.*

- (1) Know the exact ranges used in the exercises.
- (2) Announce the ranges to each target after the men have made their estimates and before the degree of light changes.
- (3) Explain why an object appears to be nearer or more distant.

- (4) Move to new terrain as often as possible and teach each man to make his estimate without props or other aids.
- (5) Teach the men to study the ground between them and the target. Use typical combat targets such as trees, bushes, rocks, ridge lines, edges of woods, weapons, positions, buildings, and bridges.
- (6) Use varied backgrounds such as the sky, woods, open fields, and bodies of water.
- (7) Give the men practice in estimating varied ranges from 100 to 1,000 yards, but concentrate on ranges of 500 yards and under.

Section IV. FIELD TARGET FIRING PROBLEMS

14. General

The problems listed in paragraph 15 are suggested for field target firing exercises. Instructors may create similar ones for variety.

15. Problems

a. A situation where the squad, in position, is fired upon initially by a line of riflemen. Other targets can be presented after the squad delivers fire on the initial target.

b. A situation where the squad, moving toward the firing positions in a combat formation, is fired upon by a line of riflemen. Other targets should be presented after this initial target.

c. A situation where the squad, moving forward in a combat formation, is fired upon by a machinegun.

d. A situation to show the action of the security element, squad leader, and other members of the squad when the security element discovers a group of the enemy without being seen themselves.

e. A situation which initially requires either a part or all of the squad's riflemen to fire and which, later in the exercise, requires the use of the automatic rifle team against a surprise target.

APPENDIX III

SAFETY

1. General

Safety precautions must be observed during all rifle marksmanship training. This appendix lists the important ones for each phase of training, but it is not intended to replace AR 385-63 or local range regulations.

2. Mechanical Training

a. All rifles must be cleared before conducting mechanical training.

b. All dummy rounds must be carefully checked to insure that there are no live ones among them.

c. Toolboxes, spare parts boxes, and other containers must be checked for the presence of live rounds.

3. Preparatory Marksmanship Training

a. All dummy rounds must be carefully checked to insure that there are no live rounds among them.

b. All rifles will be inspected by an officer or noncommissioned officer to see that they are clear and that there are no obstructions in the bores.

c. Rifles will have the bolts open and the safeties on except during the conduct of dry firing exercises.

d. Rifles will be carried with the muzzle up and pointing downrange.

e. Rifles will not be carelessly pointed at anyone. They should always be treated as if they were loaded.

4. Range Firing

a. A red streamer will be displayed from a prominent place on the range during all firing.

b. Prior to firing, all individuals will be informed of the safety limits of the range.

c. No firing will be conducted until the prescribed roadblocks and guards have been placed.

d. Prior to firing, all rifles will be inspected by an officer or noncommissioned officer to see that they are clear and that there are no obstructions in the bores.

e. Ammunition will be drawn only on command of the control officer.

f. Rifles will be loaded only on command of the control officer. Unless this command has been given, rifles will have the bolts open and the safeties on.

g. Rifles will be carried with the muzzle up and pointing downrange.

h. Rifles will be placed on rests when not in use.

i. Rifles will not be removed from the firing line until they have been cleared.

j. Dry firing will not be permitted in rear of the firing line unless it is conducted under competent supervision.

k. No smoking is permitted on the firing line or near ammunition.

l. No running is permitted on the range.

m. No one is permitted to move forward of the firing line unless the control officer gives them clearance.

n. The command to commence firing will not be given until a clearance has been received from the pit officer.

o. Anyone observing an unsafe condition is authorized to give the command to cease firing. When this command is given, it will be relayed to the control officer who will repeat the command and investigate the condition before resuming firing.

p. When the command to cease firing is given, all rifles will be unloaded, cleared, and locked.

q. Target operators will remain at their targets unless they have been granted permission to leave.

r. Target operators and all members of the pit detail will wear steel helmets.

s. No one will leave the pit until clearance has been received from the control officer.

t. Target operators will not expose any part of their bodies above the butts when marking targets or at any other time while firing is being conducted.

u. After firing, all rifles will be inspected by an officer or noncommissioned officer to insure that they are clear. At this inspection it will be determined that individuals have turned in all live rounds and brass.

5. Field Target Firing

a. Individuals may load only when they are in the prone position on the firing line.

b. No one is allowed forward of the firing positions.

c. Individuals desiring to move on the firing line must have their weapons cleared by the safety officer.

d. Firing limits of the range should be clearly marked and all firing must be kept within these limits.

e. All weapons must be cleared before they are removed from the firing line.

6. Squad Assault Night Firing

a. No one will fire until targets downrange are activated.

b. No one will fire outside of the safety limits.

c. Each firer will be accompanied by an assistant instructor to insure safety. If any of the following conditions occur, the assistant instructor will tap his firer on the shoulder, at which time the firer will lock, point his weapon up, continue moving, and consider himself a casualty.

(1) Firer gets too far ahead or too far behind the squad.

(2) Firer gets too close to the man on his right or left.

(3) Firer shoots wildly.

(4) Firer stops for any reason.

(After being declared a casualty, the firer will proceed to the cease-fire line under the direction of the assistant instructor.)

d. If the firer falls or stumbles to the ground, the assistant instructor will take his weapon and lock it, then direct the student to continue to the cease-fire line.

e. If a weapon fails to fire, the firer will apply immediate action while moving. If the weapon still fails to fire, the assistant instructor has the

firer lock and keep moving to the cease-fire line.

f. Automatic riflemen will fire only on their halves of the line of targets.

g. Weapons will be cleared, unexpended ammunition collected, and targets scored before firers return uprange.

h. If the whistle is blown at any time during the conduct of the problem, firers will halt in place, lock, hold their rifles with the muzzles up, and await further instructions from the safety officer.

APPENDIX IV

SMALL BORE FIRING

1. General

Small bore firing is marksmanship training with the .22 caliber rifle. It provides an excellent means of improving the shooting in units and of sustaining interest in marksmanship throughout the year. It can be used to determine the state of marksmanship training of a unit so that deficient firers can be given immediate attention when they start the marksmanship training program with the M1 rifle.

2. Conduct of Small Bore Firing

Small bore firing is conducted on a 50-foot range (indoors or outdoors) using the official 50-foot, small bore target. The principles and procedures as outlined in this manual apply to small bore firing with minor modifications necessitated by the difference in the rifle used. Information concerning the .22 caliber rifle may be found in TM 9-280.

3. Small Bore Firing Course

a. The following course is used for instruction and record firing. Instruction firing should be conducted at least twice if ammunition allowances permit.

Small Bore Firing Course, Instruction and Record Firing

Time limit	Rounds	Position
None-----	*9	Prone (for zero).
None-----	5	Prone.
None-----	5	Kneeling or squatting.
None-----	5	Standing.
40 seconds-----	5	Prone (rapid).
40 seconds-----	5	Sitting (rapid).

*Fired for instruction only. The rifle is zeroed by the single-shot method (par. 75). For record firing, only one round is fired on each bull's-eye (both slow and rapid fire).

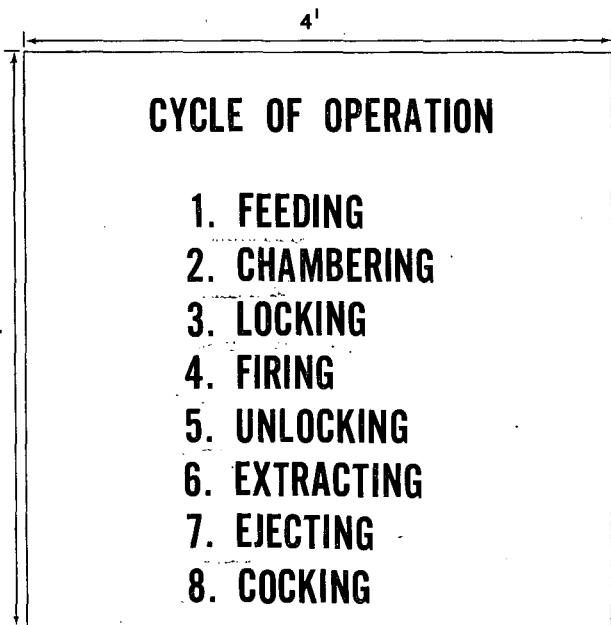
b. The minimum qualifications scores for the small bore course are—

Possible -----	250
Expert -----	200
Sharpshooter-----	180
Marksman -----	160

APPENDIX V

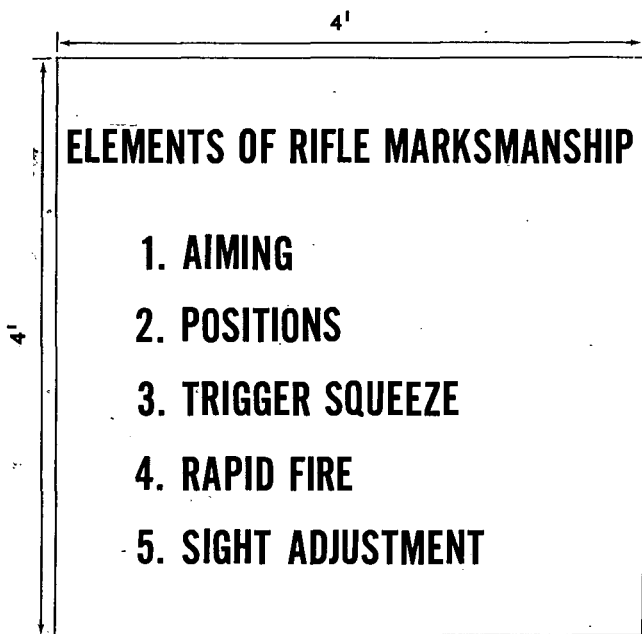
TRAINING AIDS

Training aids should be used to the maximum in rifle marksmanship training. A model, picture, or chart can be used to explain a principle or technique which would otherwise take many words. The following figures show some of the training aids which are appropriate for the conduct of rifle marksmanship instruction. They are not intended to limit the imagination of individual rifle instructors or replace the aids listed in training aid catalogs.



**4 INCH LETTERS
BLACK ON WHITE**

Figure 147. Cycle of operation.



**4 INCH LETTERS
BLACK ON WHITE**

Figure 148. Elements of rifle marksmanship.

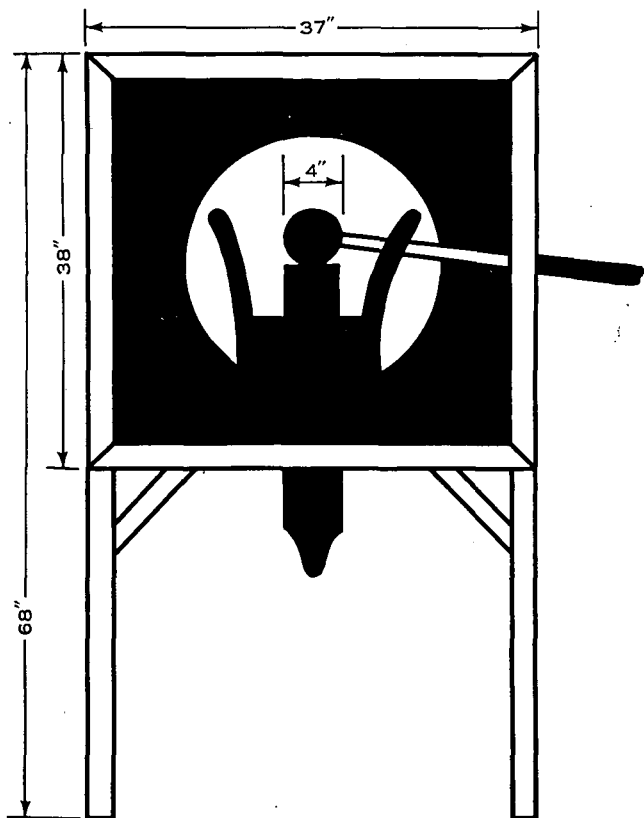


Figure 149. Sight picture model.

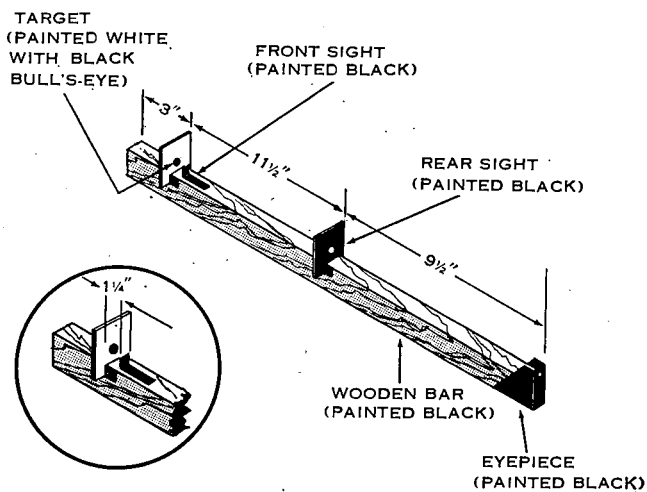


Figure 150. Aiming bar.

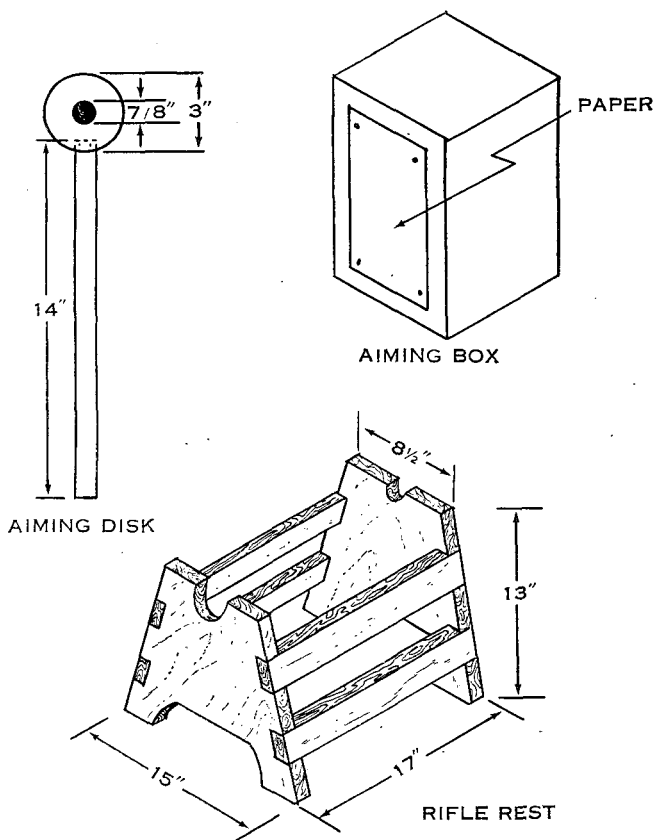


Figure 151. Aids for the conduct of the second and third aiming exercises.

FIRING DATA CARD					
RANGE			HOUR		COMPUTATION $\frac{RV}{15}$
POSITION			DATE		
			WEATHER		
NO.	EL	WIND	LIGHT		WIND VELOCITY
1			CALL TARGET		HIT TARGET
2					
3					
4					
5					
6					
7					
8					USE NUMBERS TO DESIGNATE LOCATION
9			ZERO ELEV	ZERO WIND	TOTAL SCORE
10					

Figure 152. Firing data card blackboard.

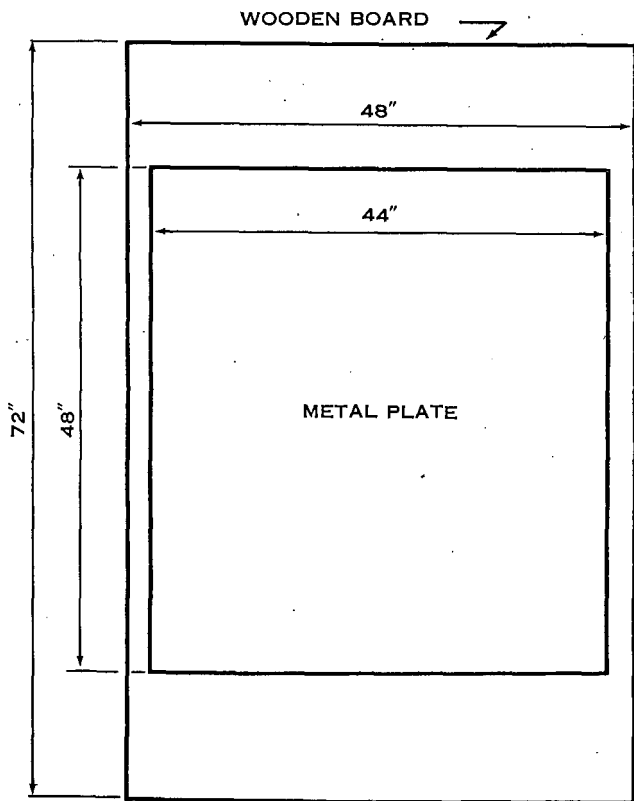


Figure 153. Magnetic target.

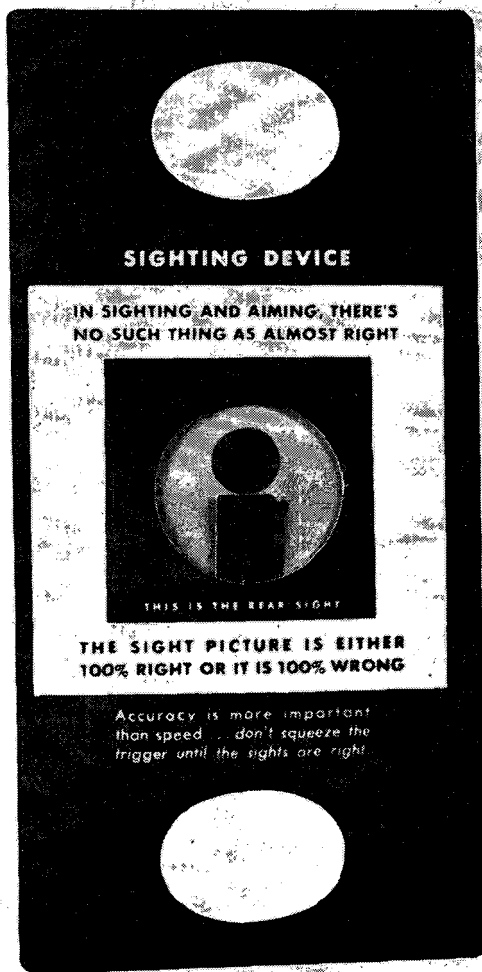


Figure 154. M15 sighting device.

APPENDIX VI

TECHNIQUES OF COACHING

Section I. GENERAL

1. The Coach

a. There are three requirements for a good coach. He must have an excellent knowledge of his job, which means he should be a qualified rifleman; he must have a great desire to share his knowledge of marksmanship with others and the ability to impart this knowledge. Finally, he must be completely sold on the importance of good rifle marksmanship and be able to pass that attitude on to his firers.

b. It is difficult even for an expert rifleman to fulfill all the requirements of a good coach unless he has been taught how to impart his knowledge to others. For this reason, he must himself undergo the training dealt with in sections II and III with the specific aim of becoming a trained coach.

2. Tools for the Coach

a. In addition to the special coaching instruction he receives, a good coach will call on experience to aid him in his job. He will give his men the advantage of everything he has learned from experience that will help them to become good marksmen. For example, he may have found a

simpler and clearer way of explaining sight alignment than his own instructor used, or he may have discovered a way of holding steadily in the standing position two or three seconds longer than the average rifleman can manage. He will pass this on to his men.

b. A good coach will study and learn thoroughly all the information he can find on marksmanship training. As a minimum, he will familiarize himself with all the details on marksmanship instruction and coaching in this manual and in DA Pamphlet 23-2, "Hits Count."

3. Coaching Objectives

a. The overall objective of coaching is to produce soldiers who can kill enemy soldiers with a rifle under the trying conditions of combat. To do this, a coach must give the rifleman confidence in his weapon and in his ability to use it well in spite of the confusion, stresses, and discomforts of the battlefield.

b. The coach's immediate objective with beginners is to insure their ability to make a small shot group so that they can properly zero their rifles and get consistent hits. During the initial stage of instruction in aiming, positions, trigger squeeze, rapid fire, and sight adjustment, the coach's job is to show the firer the *right way* to do it. Showing a man the correct way to shoot and seeing that he does it from the beginning is one of the major aims of a good coach. This does not mean that the coach insists on his men obtaining perfection in each step before proceeding to the next. It means that he makes sure the firer learns the right way to perform at the out-

set and applies consistently what he has learned. From then on, it is a matter of practice, and the firer soon acquires good shooting habits.

c. With the more advanced rifleman, the coaching objective is to help find the cause of any more-or-less consistent errors he is making, remind him of the cures for them, and encourage him to apply the rules by constructively criticizing his shooting performance.

Section II. TECHNIQUES

4. General

a. The coaching techniques used for the beginner and the expert are fundamentally the same. With a beginner, the coach may have to contend with such hindrances to good shooting as fear, nervousness, forgetfulness, failure to comprehend, and a lack of coordination, determination, or willpower. An expert rifleman is often the unconscious victim of many of the same hindrances which are frequently complicated by cockiness and carelessness. With both types of firer, the coach's job is to see that he recognizes his shooting errors, understands what is causing them, and applies the remedies for them.

b. The coach must not only be able to detect errors and determine their cause and cure. He must also be able to calm his firer and inspire him to practice the fundamentals that lead to shooting perfection.

c. The main problem on the firing line is to quickly isolate the cause of an error that is giving difficulty. If a firer is shooting into the butts or spattering the target, the coach must be able to

tell him whether he is flinching, jerking, or bucking, and whether he is aiming, holding, or squeezing the trigger badly. Sometimes more than one of these factors will be involved. The coach can determine where the blame lies only by watching the firer—his head, face, shoulders, trigger finger, left hand and arm, and his rifle. In addition to this, the coach should watch and analyze the firer's hits on the target. While there are many combinations of errors that can cause the same pattern of hits, an analysis of the target in conjunction with close observation of the firer usually enables the coach to pinpoint the source of the trouble. See also paragraph 6.

5. Reasonable Restraint in Coaching

If a firer can make an adequate shot group on the target, he is firing satisfactorily and should be allowed to continue without interruption. If he is not able to do this, the coach should give him further instruction. What constitutes an adequate shot group must be left to the judgment of the coach. There are many things he should consider in making his decision: the firer's state of training, the target, range, firer's position, wind, light, and the condition of the rifle. As a reasonable guide, a firer should be able to make a shot group within the bull's-eye from the prone position, and the group should be no larger than twice the size of the bull's-eye when he fires from the standing and kneeling positions.

6. Causes of and Cures for Inadequate Shot Group

a. Poor Position and Holding. For the beginner, correct position and holding is the foundation

for good shooting. Without a stable and well-balanced position it is difficult, if not impossible, for him to hold the rifle steady enough to fire effectively. A position that is so poor that it affects the shot group is clearly indicated by a wavering rifle. Faulty positions should be corrected with additional practical work in rear of the firing line.

b. Errors in Aiming. When errors in aiming are indicated, the coach should check the firer's alinement and sight picture with the M2 aiming device. Corrective instruction is given in rear of the firing line.

c. Improper Trigger Squeeze. An improper trigger squeeze is usually caused by the firer flinching at some instant between the time he takes up the slack and the time the bullet leaves the muzzle, or it is caused by the firer jerking the trigger.

- (1) The flinch may be defined as the involuntary contraction of a muscle (or muscles) made in anticipation of the shock of recoil or the sound of the rifle firing. It is a common reaction of beginners and even seasoned firers who know the instant when the rifle is going to fire.
- (2) The jerk may be defined as an uncontrolled, spasmodic contraction of the trigger finger. It is usually caused by the firer's effort to shoot well. That is, the instant he alines his sights and sees a good sight picture he jerks the trigger, hoping the bullet will leave the muzzle

and get under way to the bull's-eye before he loses the sight picture. Unfortunately, no matter how quickly and carefully he jerks the trigger, the movement is always too violent for him to hold his sight alinement.

- (3) The buck may be defined as a sudden movement of the right shoulder (right-handed firer). It may be a noticeable forward motion or only a general tensing of the shoulder muscles. It is the firer's way of fighting recoil and it can spoil his best efforts to squeeze the trigger properly.
- (4) When a coach suspects that a firer is not squeezing the trigger properly, he can detect it with certainty—and correct it—by applying the ball and dummy method of firing. He must first make sure, of course, that the improper trigger squeeze is not caused or complicated by faulty position and holding. For example, if the firer is bucking, the coach must see that he holds the rifle butt firmly against his shoulder muscles and that the sling is tight enough to help him do this. Trigger squeeze is corrected on the firing point.

7. Coach's Procedure for Checking and Correcting Trigger Squeeze

The coach should follow the procedure below in checking and giving instruction in trigger squeeze.

a. Follow the sequence and methods for detecting and correcting improper trigger squeeze as set forth in paragraph 60*d*, *e*, and *f*. In addition, use any or all of the suggestions in *b* through *d* below that will help the firer.

b. Try to prove to or convince the firer that there is a definite feel to the rifle when the firing comes as a surprise; that is, when the trigger is properly squeezed. To let him get this feel, have him fire with nothing on his mind but trigger squeeze. He can concentrate on trigger squeeze alone and get results by firing downrange with his eyes closed, using a ball and dummy clip.

c. If the firer is not convinced that faulty trigger squeeze is causing his bad shot groups, have him assume a good position, but with his right hand at the small of the stock. Squeeze the trigger for him. This invariably results in a better shot group.

d. After going through the practice suggested in *b* or *c* above, have the firer resume normal firing, but make him understand that he must expect his rifle to waver and that this makes it difficult for him to obtain and hold a perfect sight picture.

e. Repeat any or all of the instruction as necessary.

8. General Troubleshooting Procedure

The coach's troubleshooting procedure boils down to a single process of determining and eliminating the causes of failure, starting with the most frequent and working through the list in the order of diminishing frequency.

a. Continuously watch the firer and the results of his firing so you can start corrective instruction at the first indication that he needs it. If you are supervising several men at the same time, you will have to depend to a considerable extent on watching and analyzing their targets.

b. At the first indication of poor shooting, check the firer for the major, obvious errors, and check his weapon for mechanical failure. In most cases, it is best to disregard small errors that do not greatly affect shooting so the firer can concentrate on sight picture and trigger squeeze. That is, a good coach does not clutter up a firer's mind with corrections of minor errors in position or make him spend a lot of time correcting a failure to squeeze the trigger straight to the rear when a bad flinch or trigger jerk is causing him to shoot into the butts.

c. If you cannot visually determine the cause of shooting errors, check the firer's trigger squeeze as described in paragraph 7.

d. If you find that the firer is squeezing the trigger properly, check his alinement and sight picture with the M2 aiming device.

e. If the fault does not lie with any of the above, check the accuracy of the rifle. Fire it yourself and have one or more other good marksmen fire it. Rifle failure, as well as faulty trigger squeeze, must be corrected on the firing line.

f. After giving a firer corrective instruction, permit him to resume firing, but observe him from time to time for a recurrence of the trouble.

Section III. COACH'S CHECKLISTS

9. Checklist for Slow Fire

a. Check to see that the —

- (1) Rifle is cleared and defective parts have been replaced.
- (2) Ammunition is clean.
- (3) Sights have been blackened and set correctly for elevation and windage.

b. Observe the firer to see that he—

- (1) Has the correct position and has the sling adjusted properly.
- (2) Loads the rifle properly and only on command.
- (3) Takes up slack correctly.
- (4) Squeezes the trigger correctly. Determine whether he flinches, jerks, or bucks by watching his head, shoulders, trigger finger, and left hand and arm.
- (5) Calls his shot each time he fires.
- (6) Holds his breath correctly (by watching his back occasionally).
- (7) Obtains correct sight alinement (by cautioning him to check it carefully and by checking him with the M2 aiming device).
- (8) Releases pressure on the trigger and lowers his rifle a moment when he does not get off a round within 8 or 9 seconds.
- (9) Keeps his firing data card correctly.

c. If a firer becomes tense and nervous, have him breathe deeply several times to relax.

d. After firing has been completed, inspect the rifle to make sure the firer has cleared and locked it.

10. Checklist for Rapid Fire

a. Make all the checks listed for slow fire.

b. Check to see that the—

(1) Rifle is cleaned and ammunition is in the belt.

(2) Clip to be used has no protruding, dirty, or defective rounds.

c. When a firer gets a position on the line and stands up, make sure he does not move his feet out of place.

d. Make sure that the firer assumes the position rapidly; takes up the slack; takes the necessary time to squeeze each shot carefully without wasting time; breathes correctly (by having him count each shot aloud); and that he reloads without flinching.

e. See that the firer does not rise from position before the command to cease firing is given.

APPENDIX VII

STOWAGE OF ACCESSORIES IN BUTT STOCK

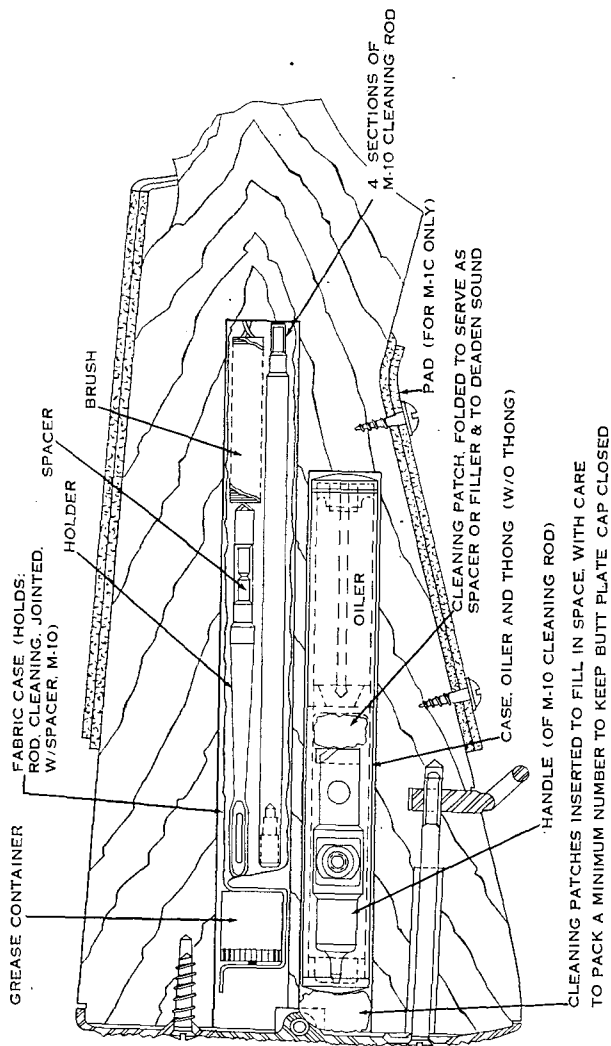


Figure 155. *Storage of accessories in butt stock of M1 and M1C rifles.*

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[AG 353 (2 May 58)]

By Order of *Wilber M. Brucker*, Secretary of the
Army :

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official :

HERBERT M. JONES,
Major General, United States Army,
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U. S. GOVERNMENT PRINTING OFFICE: 1958

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price \$1.50